Vol. 1022 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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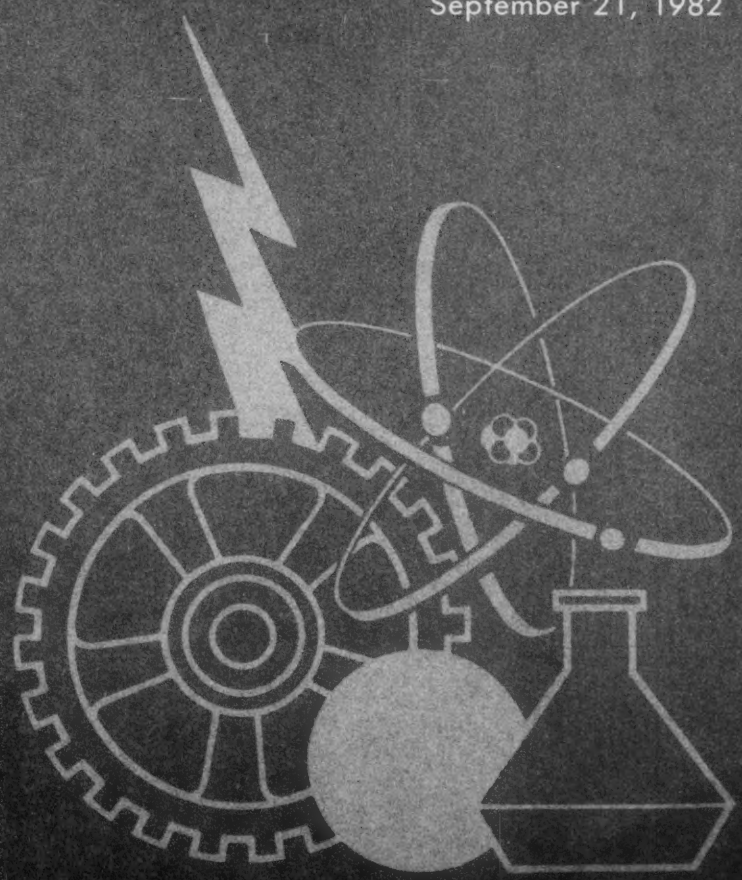
September 21, 1982



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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

September 21, 1982 Volume 1022 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981.

Note that the international fees have been increased as of Jan. 1, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Fees	
Basic Fee (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation Fees	65.00

GERALD J. MOSSINGHOFF,
Jan. 19, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,010,223, Re. S.N. 394,463, Filed July 1, 1982, Cl. 525/10, ADDUCTS CONTAINING SUCCINIC GROUPS ATTACHED TO ELASTOMERIC COPOLYMERS, Stanley W. Cyowood, Jr., Owner of Record: *E. I. Du Pont De Nemours & Co., Wilmington, Del.,* Attorney or Agent: Paul R. Steyermark, Ex. Gp.: 144

4,021,092, Re. S.N. 393,705, Filed June 30, 1982, Cl. 339/103R, ELECTRICAL CONNECTOR, John E. Ericson, Jr., Owner of Record: *Ericson Mfg. Co., Willoughby, Ohio,* Attorney or Agent: J. Herman, Jr., et al., Ex. Gp.: 322

4,119,102, Re. S.N. 393,628, Filed June 30, 1982, Cl. 128/804, RADIO FREQUENCY TREATMENT OF TUMORS WHILE INDUCING HYPOTENSION, Harry H. LeVeen, Owner of Record: *Inventor,* Attorney or Agent: Jim W. Gipple, et al., Ex. Gp.: 335

4,163,527, Re. S.N. 398,931, Filed July 16, 1982, Cl. 242/55, COIL DEPLETION SENSOR, Walter J. Hood, et al., Owner of Record: *Kent Corp., Twinsburg, Ohio,* Attorney or Agent: E. R. Hamilton, et al., Ex. Gp.: 245

4,208,403, Re. S.N. 399,655, Filed July 19, 1982, Cl. 424/115, A-21978 ANTIBIOTICS AND PROCESS FOR THEIR PRODUCTION, Robert L. Hamill, et al., Owner of Record: *Eli Lilly & Co., Indianapolis, Ind.,* Attorney or Agent: Arthur R. Whale, et al., Ex. Gp.: 125

4,238,202, Re. S.N. 395,553, Filed July 6, 1982, Cl. 44/64, HYDROCARBON FUELS WITH CARBURETOR DETERGENT PROPERTIES, William J. Trepka, et al., Owner of Record: *Phillips Petroleum Co., Bartlesville, Okla.,* Attorney or Agent: Louis N. French, et al., Ex. Gp.: 113

4,273,821, Re. S.N. 397,630, Filed July 12, 1982, Cl. 428/215, FIRE PROTECTIVE TAPE, J. Watson Pedlow, Owner of Record: *Thomas & Betts Corp., Raritan, N.J.,* Attorney or Agent: Robert M. Rodrick, et al., Ex. Gp.: 164

4,277,542, Re. S.N. 399,052, Filed July 16, 1982, Cl. 338/308, RESISTANCE MATERIAL, Alexander Hendrik Boonstra, et al., Owner of Record: *U.S. Philips Corp., Tarrytown, N.Y.,* Attorney or Agent: Jack Oisher et al., Ex. Gp.: 213

4,282,051, Re. S.N. 401,019, Filed July 22, 1982, Cl. 156/71, PRESSURE-SENSITIVE FLOCKED FASTENER AND METHOD OF MAKING SAME, John M. Terpay, Owner of Record: *Inventor,* Attorney or Agent: Eugene Sabol, et al., Ex. Gp.: 355

4,299,953, Re. S.N. 393,968, Filed June 29, 1982, Cl. 536/17, MYCAROSYLTYLACTONE, Robert L. Hamill, et al., Owner of Record: *Eli Lilly & Co., Indianapolis, Ind.,* Attorney or Agent: Arthur R. Whale, et al., Ex. Gp.: 123

4,321,713, Re. S.N. 397,012, Filed July 12, 1982, Cl. 4/290, LARGE CAPACITY DRAINAGE RECEPTACLE, C. Ames Thompson, Owner of Record: *Inventor,* Attorney or Agent: Herbert E. Haynes, Jr., et al., Ex. Gp.: 243

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,504,503, Reexam. No. 90/000,244, Requested: Aug. 20, 1982, Cl. 405/157, LOCATING ELEMENTS OF CONSTRUCTION BENEATH THE SURFACE OF EARTH SOILS, Gordon H. Allen, Owner of Record: *Inventor owns 50%, The Allen System, Inc. owns 50%,* Attorney or Agent: Vaden, Eickenroht, Thompson, Bednar & Jamison, Ex. Gp.: 356, Requester: Owners of record with full interest, Houston, Tex.

3,590,854, Reexam. No. 90/000,243, Requested: Aug. 18, 1982, Cl. 137/355.16, ROLLING CONDUCTOR SUPPORT, Gordon H. Cork, Owner of Record: *McGraw-Edison Co., Rolling Meadows, Ill.,* Attorney or Agent: Hugh M. Gilroy, Ex. Gp.: 341, Requester: A & A Manufacturing Co., Inc., New Berlin, Wis.

4,281,793, Reexam. No. 90/000,245, Requested: Aug. 23, 1982, Cl. 239/011, WATER SPRINKLER WITH FLAT PLATE PATTERN CONTROL, Robert E. DeWitt, Owner of Record: *Inventor, Oswego, Ill.,* Attorney or Agent: John R. Crossan, Ex. Gp.: 313, Requester: The Toro Co., Minneapolis, Minn.

National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

SN 6-247,713. (4,343,262) LABORATORY RAT FEEDER. Dept. of Health & Human Services.

SN 6-186,363. (4,343,215) PERFORATED CYLINDER. Dept. of the Treasury.

SN 6-152,874. (4,343,189) METHOD AND APPARATUS FOR EDGEWISE COMPRESSION TESTING OF FLAT SHEETS. Dept. of Agriculture.

SN 6-246,971. (4,343,095) PRESSURE DRYER FOR STEAM SEASONING LUMBER. Dept. of Agriculture.

SN 6-180,542. (4,343,070) REMOVAL OF LINT FROM COTTONSEED. Dept of Agriculture.

SN 6-318,531. (4,342,777) POLYBUTYLBENZYLPHENOLS AND BENZYL-3, 4-METHYL-ENEDIOXYBENZENES IN INSECT POPULATION CONTROL. Dept. of Agriculture.

SN 6-254,318. A CATALYTIC COATING TO DIRECTLY GENERATE HEAT UPON THE SURFACE OF A HEAT DOME. Dept. of the Interior.

SN 6-380,471. VIBRATION DOSIMETER. Dept. of Health & Human Services.

SN 6-366,165. ISOLATION OF HEPATITIS A VIRUS STRAIN HM-175. National Institutes of Health.

SN 6-386,991. INACTIVATION OF A LIPID VIRUS. National Institues of Health.

Trademark Suits

Notices under 15 U.S.C. 1116;
Trademark Act of July 5, 1946.

Reg. No. 35,228 (LUX), Lever Brothers Co.; **Reg. No. 59,032, same; Reg. No. 681,254, same, filed** July 12, 1982, D.C., S.D. Fla. (Miami), Doc. 82-1432-CIV-WMH, *Lever Brothers Co.* v. *Cleanlux Chemical Corp.*

Reg. No. 59,032. (See Reg. No. 35,228.)

Reg. No. 97,301 (MARATHON), Marathon Oil Co., **Reg. No. 608,222** (MILE-MAKER), **same; Reg. No. 609,000** (MARATHON MILE-MAKER), **same; Reg. No. 652,617** (SUPER-M), **same; Reg. No. 652,959** (MARATHON SUPER-M), **same; Reg. No. 743,273** (M MARATHON AND DESIGN), **same; Reg. No. 824,627** (M MARATHON AND DESIGN), **same, filed** July 22, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 4573, *Marathon Petroleum Co.* v. *Sam. S. LoBosco.*

Reg. No. 297,594 ("VL" AND DESIGN), Louis Vuitton S.A., **filed** Dec. 6, 1978, D.C., S.D.N.Y., Doc. 78-Civ-5863 (CLB), *Vuitton et Fils S.A.* v. *Karen Bags, Inc., et al.* Defendants are permanently enjoined from further infringing Plaintiff's trademark. Filed July 30, 1982. **Same, filed** Mar. 9, 1982, D.C. Md. (Baltimore), Doc. J82-642, *Louis Vuitton S.A.* v. *Soretta of Reisterstown Plz., Inc.* Defendant is permanently enjoined from further infringing Plaintiff's trademark. Filed Aug. 2, 1982.

Reg. No. 298,059 (REPRESENTATION OF MOON AND STARS), The Procter & Gamble Co., **filed** July 1, 1982, D.C., N.D. Ga. (Atlanta), Doc. C82-1367A, *The Procter & Gamble Co., et al* v. *Mike Campbell.*

Reg. No. 402,475 (AA AND DESIGN), Early California Industries, Inc. **filed** May 10, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82-2278 IH, *Early California Industries, Inc., et al* v. *Pacific Eastern Trading Corp.* Plaintiff is the owner of Reg. No. 402,475 and said registration is valid. Defendant is permanently enjoined from using the letters "A", "AA" or "AAA" in connection with advertising, promotion, etc. Filed June 25, 1982.

Reg. No. 430,272 (AMBASSADOR), Allied Stores Corp., **filed** July 29, 1982, D.C., S.D.N.Y., Doc. 82-Civ-4933 ADS, *Allied Stores Corp.* v. *Ambassador Imports, Ltd.*

Reg. No. 502,629 (KAL), Makers of Kal, Inc., **filed** July 16, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 3502, *Makers of Kal, Inc.* v. *Superkal Products, Inc.*

Reg. No. 607,761 (GREAT AMERICAN INSURANCE COMPANY), Great American Insurance Co., **Reg. No. 643,400, same filed** June 18, 1982, D.C. Del. (Wilmington), Doc. 82-391, *Great American Insurance Co. (Ohio corp.)* v. *Great American Insurance Co. (Del. corp.), et al.* Plaintiff is the owner of Reg. Nos. 607,761 and 643,400 which are good and valid in law. Defendants shall not use the name Great American or the name Great American Insurance Co. etc. in connection with the sale, offering for sale, etc. of goods or services in the field of insurance or finance. Filed July 23, 1982.

Reg. No. 608,222. (See Reg. No. 97,301.)

Reg. No. 609,000. (See Reg. No. 97,301.)

Reg. No. 643,400 (GREAT AMERICAN INSURANCE COMPANY), Great American Insurance Co., **filed** June 17, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82-3033R, *Great American Insurance Co.* v. *Anant Kumar.*

Reg. No. 643,400. (See Reg. No. 607,761.)

Reg. No. 646,221 (UNION MADE ETC. AND DESIGN), International Association of Machinists and Aerospace Workers; **Reg. No. 1,104,537** (INTERNATIONAL ASSOCIATION OF MACHINISTS OF AEROSPACE WORKERS AND DESIGN), **same; Reg. No. 1,107,599** (INTERNATIONAL ASSOCIATION OF MACHINISTS AND AEROSPACE WORKERS AND DESIGN), **same; Reg. No. 1,133,886** (INTERNATIONAL ASSOCIATION OF MACHINISTS AND AEROSPACE WORKERS AND DESIGN), **same, filed** Feb. 8, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82-0593R, *International Association of Machinists & Aerospace Workers* v. *International Automated Media, Inc.* Defendant is hereby enjoined from further infringing Plaintiff's trademarks. Filed May 3, 1982.

Reg. No. 652,617. (See Reg. No. 97,301.)

Reg. No. 652,959. (See Reg. No. 97,301.)

Reg. No. 676,630 (TRON), McGraw-Edison Co.; **Reg. No. 844,016, same, filed** July 9, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 4286, *McGraw-Edison Co.* v. *Walt Disney Productions, et al.*

Reg. No. 676,630 (TRON), McGraw-Edison Co.; **Reg. No. 844,016, same; Reg. No. 1,135,217** (TRONS), Mego Corp., **filed** July 9, 1982, D.C., S.D.N.Y., Doc. 82-Civ-4490, *Walt Disney Productions* v. *McGraw-Edison Co.*

Reg. No. 681,254. (See Reg. No. 35,228.)

Reg. No. 714,826 (HOMETEL), Hometels of America Franchising, Inc.; **Reg. No. 1,137,050** (THE SUITE HOTEL DEAL), **same, filed** July 21, 1982, D.C. Colo. (Denver), Doc. 82-M-1235, *Hometels of America Franchising, Inc.* v. *Family Home-Tel.*

Reg. No. 718,413 (IGLOO), Igloo Corp.; **Reg. No. 961,185, same, filed** Jan. 26, 1982, D.C.N.J. (Newark), Doc. 82-211, *Igloo Corp.* v. *Igloo Line, Inc.* Consent order for permanent injunction filed July 15, 1982.

Reg. No. 743,273. (See Reg. No. 97,301.)

Reg. No. 761,091 (ALLSTATE), Allstate Insurance Co.; **Reg. No. 840,187, same; Reg. No. 1,122,022** (YOU'RE IN GOOD HANDS WITH ALLSTATE), **same, filed** June 23, 1982, D.C. Ariz. (Phoenix), Doc. 82-951-PHX-CAM, *Allstate Insurance Co.* v. *Howard D. Hanson, et al.* **Same, filed** July 1, 1982, D.C. Colo. (Denver), Doc. 82-K-1133, *Allstate Insurance Co.* v. *Allstate Realty of Colorado, Inc.* **Same, filed** July 12, 1982, D.C. Nev. (Reno), Doc. CV-R-82-243-ECR, *Allstate Insurance Co.* v. *All State Realty, Inc., et al.*

Reg. No. 809,055 (ORIGINAL HOT DOG SHOP), Original Hot Dog Shops, Inc., **filed** Dec. 22, 1981, D.C., W.D. Pa. (Pittsburgh), Doc. 81-2273, *Original Hot Dog Shops, Inc.* v. *Jiffy Foods Corp., et al.* Action dismissed without prejudice on Mar. 25, 1982.

Reg. No. 824,627. (See Reg. No. 97,301.)

Reg. No. 840,186 (ROYAL-GLOBE INSURANCE ETC. AND DESIGN), Royal Indemnity Co.; **Reg. No. 843,017** (ROYAL INSURANCE COMPANY, LIMITED AND DESIGN), **same; Reg. No. 888,464** (ROYAL GUARD), **same, filed** Mar. 15, 1982, D.C., N.D. Ga. (Atlanta), Doc. C82-527A, *Royal Indemnity Co., also known as Royal Insurance* v. *Royale Insurance Agency, Inc., doing business as Royal Insurance Agency.* Defendant is permanently enjoined from using "ROYALE," "ROYAL" or any other word confusingly similar to any company of ROYAL INSURANCE group in connection with the sale, distribution, etc. of insurance or insurance related services. Filed June 30, 1982.

Reg. No. 840,187. (See Reg. No. 761,091.)

Reg. No. 843,017. (See Reg. No. 840,186.)

Reg. No. 844,016. (See Reg. No. 676,630.)

Reg. No. 864,688 (DOCKTOR), Docktor Pet Centers, Inc.; **Reg. No., 908,817** (DOCKTOR PET CENTER AND DESIGN), **same; Reg. No. 919,625** (DOCKTOR$_X$'S), **same; Reg. No. 921,209** (DOCKTOR$_X$'S), **same; Reg. No. 1,070,868** (DOCKTOR AND DESIGN), **same; Reg. No. 1,071,042** (DOCKTOR AND DESIGN), **same; Reg. No. 1,072,409** (DOCKTOR PET CENTERS), **same; Reg. No. 1,097,167** (DOCKTOR AND DESIGN), **same; Reg. No. 1,103,578** (DOCKTOR$_X$), **same, filed** Mar. 16, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82-1286, *Docktor Pet Centers, Inc.* v. *Russo's Pets, Inc., doing business as World's Largest Pet Store.* Stipulation and order filed July 8, 1982.

Reg. No. 866,320 (M AND DESIGN), Mida Mfg. Co.; **Reg. No. 870,472** (MINI DOT AND DESIGN), **same; Reg. No. 870,473** (MICRO DOT AND DESIGN), **same; Reg. No. 874,246** (DOTS), **same, filed** July 26, 1982, D.C., S.D.N.Y., Doc. 82-Civ-4860 (JES), *Mida Mfg. Co.* v. *S. Axelrod Co., Inc.*

Reg. No. 870,472. (See Reg. No. 866,320.)

Reg. No. 870,473. (See Reg. No. 866,320.)

Reg. No. 874,246. (See Reg. No. 870,472.)

Reg. No. 888,464. (See Reg. No. 840,186.)

Reg. No. 904,499 (S-T-R-E-T-C-H & SEW), Stretch & Sew, Inc.; **Reg. No. 943,019** (S-T-R-E-T-C-H & SEW AND DESIGN), **same; Reg. No. 971,584** (S-T-R-E-T-C-H & SEW), **same; Reg. No. 981,389** (S-T-R-E-T-C-H AND SEW FABRICS AND DESIGN), **same; Reg. No. 1,049,850** (S-T-R-E-T-C-H & SEW FABRICS), **same, filed** July 15, 1982, D.C. Colo. (Denver), Doc. 82-JM-1188, *Stretch & Sew, Inc.* v. *Ronald E. Futrell.*

Reg. No. 905,126 (STAR TREK), Paramount Pictures Corp.; **Reg. No. 1,077,290, same; Reg. No. 1,095,937, same; Reg. No. 1,096,032, same; Reg. No. 1,096,135, same; Reg. No. 1,098,210, same; Reg. No. 1,160,868, same; Reg. No. 1,169,496, same, filed** July 22, 1982, D.C., S.D.N.Y., Doc. 82-4811 (MJL), *Paramount Pictures Corp.* v. *Dynacomp, Inc.*

Reg. No. 908,817. (See Reg. No. 864,688.)

Reg. No. 919,625. (See Reg. No. 864,688.)

Reg. No. 921,209. (See Reg. No. 864,688.)

Reg. No. 923,423 (BERKEBILE 2+2), The Berkebile Oil Co., Inc.; **Reg. No. 1,196,034** (2 +2), **same, filed** June 9, 1980, D.C.N.J. (Newark), Doc. 80-1649, *The Berkebile Oil Co., Inc.* v. *Rolling Auto Store, Inc., et al.*

Reg. No. 925,654 (WESTERN SIZZLIN AND DESIGN), Western Sizzlin Steak House Franchises, Inc.; **Reg. No. 945,982** (WESTERN SIZZLIN STEAK HOUSE AND DESIGN), **same; Reg. No. 1,049,143** (SIZZLIN), **same; Reg. No. 1,076,712** (FLAMEKIST), **same; Reg. No. 1,126,269** (WESTERN SIZZLIN STEAK HOUSE AND DESIGN), **same, filed** Oct. 27, 1980, D.C., M.D. Fla. (Orlando), Doc. 80-569-ORL-CIV-R, *Western Sizzlin Steak House* v. *Sheila Dyches Crosby.* Action dismissed with prejudice. Defendant to bear all cost. Filed Feb. 19, 1981.

Reg. No. 934,171 (LINENS 'N THINGS), E. W. Kalkin, Inc., **filed** June 28, 1982, D.C., N.D. Ill. (Chicago), Doc. 82C4021, *E. W. Kalkin, Inc.* v. *Linens & Things, Ltd.*

Reg. No. 943,019. (See Reg. No. 904,499.)

Reg. No. 945,982. (See Reg. No. 925,654.)

Reg. No. 961,185. (See Reg. No. 718,413.)

Reg. No. 963,828 (KWIK-KOPY AND DESIGN), Kwik-Kopy Corp.; **Reg. No. 1,088,878** (KWIK-KOPY), **same; Reg. No. 1,115,789** (KWIK-KOPY), **same, filed** July 23, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 4610, *Kwik-Kopy Corp.* v. *Koffend's Kwik-Kopy, Inc.*

Reg. No. 971,584. (See Reg. No. 904,499.)

Reg. No. 977,015 (VIDAL SASSOON), Vidal Sasson, Inc.; **Reg. No. 986,872, same; Reg. No. 986,983, same; Reg. No. 1,065,108, same; Reg. No. 1,065,957, same filed** Nov. 7, 1979, D.C., S.D.N.Y., Doc. 79-Civ-6013 RWS, *Sasson Jeans, et al* v. *Vidal Sasson, Inc., et al.* Plaintiffs are permanently enjoined from directly or indirectly pronouncing or licensing pronunciation of the corporate, trade name or trademark "SASSON" so that the last syllable is pronounced as "soon". Filed Apr. 18, 1980.

Reg. No. 981,389. (See Reg. No. 904,499.)

Reg. No. 982,081 (RTR AND DESIGN), The Russian Tea Room, Inc.; **Reg. No. 1,005,635** (RUSSIAN TEA ROOM), **same, filed** Mar. 2, 1982, D.C., C.D. Calif. (Los Angeles), Doc. CV82-1060-RJK(Gx), *The Russian Tea Room, Inc.* v. *Varsham Corp., doing business as Russian Tea Room.* Consent judgment entered on Mar. 15, 1982.

Reg. No. 986,872. (See Reg. No. 977,015.)

Reg. No. 986,983. (See Reg. No. 977,015.)

Reg. No. 1,005,635. (See Reg. No. 982,081.)

Reg. No. 1,017,548 (SLEEPY-TIME), Celestial Seasonings, Inc.; **Reg. No. 1,114,293** (THE RED ZINGER), **same, filed** July 13, 1982, D.C. Colo. (Denver), Doc. 82-M-1173, *Celestial Seasonings, Inc.* v. *San Francisco Herb & Natural Food Co.*

Reg. No. 1,021,970 (WINDSOR), Windsor Industries, Inc.; **Reg. No. 1,094,278** (HOUSE OF WINDSOR), **same, filed** July 13, 1982, D.C., S.D.N.Y., Doc. 82-Civ-4547, *Windsor Industries, Inc.* v. *U.S. Diamond Imports, et al.*

Reg. No. 1,049,143. (See Reg. No. 925,654.)

Reg. No. 1,049,850. (See Reg. No. 904,499.)

Reg. No. 1,054,498 (THE CLEANING PEOPLE WHO CARE), Servicemaster Industries, Inc., **filed** July 29, 1982, D.C. Neb. (Omaha), Doc. 82-0-366, *Servicemaster Industries, Inc.* v. *Merry Maids, Inc.*

Reg. No. 1,054,788 (KING AND DESIGN), King Meat Packing Co., **filed** Feb. 19, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 0825 WPG, *King Meat Packing Co.* v. *Apex Meat Co., et al.* Plaintiff is the owner of Reg. No. 1,054,788. Defendant is enjoined from further infringing Plaintiff's trademark. Filed June 18, 1982.

Reg. No. 1,065,108. (See Reg. No. 977,015.)

Reg. No. 1,065,957. (See Reg. No. 977,015.)

Reg. No. 1,070,359 (CANEI), Luigi Bosca & Figli, S.p.A., **filed** June 2, 1982, D.C., S.D.N.Y., Doc. 82-Civ-4335 RJW, *Luigi Bosca & Figli, S.p.A., et al* v. *Massie-Simms Associates, Inc., et al.*

Reg. No. 1,070,868. (See Reg. No. 864,688.)

Reg. No. 1,071,042. (See Reg. No. 864,688.)

Reg. No. 1,072,409. (See Reg. No. 864,688.)

Reg. No. 1,075,909 (CVA AND DESIGN), Connecticut Valley Mfg., Inc.; Pat. No. 4,065,866, Connecticut Valley Mfg., Inc., MUZZLE LOADING FIREARM, **filed** June 14, 1982, D.C. Conn. (Hartford), Doc. H-82-568, *Connecticut Valley Arms, Inc. & Connecticut Valley Mfg., Inc.* v. *Traditions, Inc., et al.*

Reg. No. 1,076,712. (See Reg. No. 925,654.)

Reg. No. 1,077,290. (See Reg. No. 905,126.)

Reg. No. 1,079,083 (JAZZERCISE), Judi Sheppard Missett; **Reg. No. 1,144,541** (JAZZ-ER-CISE AND DESIGN), **same, filed** Mar. 2, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 1104, *Jazzercise, Inc.* v. *Gateway Records, et al.*

Reg. No. 1,085,017 (TMC), Advo System, Inc., **filed** Apr. 1, 1982, D.C., N.D. Ga. (Atlanta), Doc. C82-668A, *Advo System, Inc.* v. *Front Door Dispatch, Inc. of Kentucky, doing business as The TMC Co. Total Market Coverage.* Plaintiff is the owner of Reg. No. 1,085,017 which is valid. Defendant is enjoined from further infringing Plaintiff's trademark. Filed June 24, 1982.

Reg. No. 1,086,041 (CALVIN KLEIN), Calvin Klein Co., **filed** July 9, 1982, D.C., S.D. Fla. (Miami), Doc. 82-1401-CIV-SMA, *Calvin Klein Co., et al* v. *Dreams Unlimited, Inc., et al.*

Reg. No. 1,086,489 (MEMBERS ONLY), Europe Craft Imports, Inc., **filed** July 7, 1982, D.C., C.D. Calif. (Los Angeles), Doc. CV-82-3325-IH, *Europe Craft Imports, Inc.* v. *Valentino's Fashions, et al.*

Reg. No. 1,088,878. (See Reg. No. 963,828.)

Reg. No. 1,092,544 (CUTTERY), Creative Hairdressers, Inc.; **Reg. No. 1,095,509** (THE HAIR CUTTERY), **same, filed** May 28, 1982, D.C. Md. (Baltimore), Doc. B-82-1438, *Creative Hairdressers, Inc., doing business as The Hair Cuttery* v. *Dana Elmo, doing business as Clarks Lane Hair Cuttery.* Plaintiff is the owner of Reg. Nos. 1,092,544 and 1,095,509. Defendant is permanently enjoined from further infringing Plaintiff's trademarks. Filed July 16, 1982.

Reg. No. 1,094,278. (See Reg. No. 1,021,970.)

Reg. No. 1,095,509. (See Reg. No. 1,092,544.)

Reg. No. 1,095,937. (See Reg. No. 905,126.)

Reg. No. 1,096,032. (See Reg. No. 905,126.)

Reg. No. 1,096,110 (JORDACHE), Jordache Enterprises, Inc., **filed** July 14, 1982, D.C., S.D.N.Y., Doc. 82-Civ-4578 (TPG), *Jordache Enterprises, Inc., et ano* v. *Panaria International, Inc., et al.* **Same, filed** Aug. 3, 1981, D.C. Md. (Baltimore), Doc. N-81-1947, *Jordache Enterprises, Inc., etc.* v. *J & C Wholesalers, etc., et al.* Plaintiff is the owner of Reg. No. 1,096,110, which is valid and subsisting. Defendants are permanently enjoined from further infringing Plaintiff's trademark. Filed July 28, 1982. **Same, filed** July 28, 1982, D.C., S.D.N.Y., Doc. 82-Civ-4908 WK, *Jordache Enterprises, Inc.* v. *Columbia Sportswear, Inc., et al.* Action dismissed without prejudice and without costs to either party on July 30, 1982. **Same, filed** Aug. 3, 1982, D.C., S.D.N.Y., Doc. 82-Civ-5035 MEL, *Jordache Enterprises, Inc.* v. *Hanil Import & Export, Inc., also known as K.I.C. Trading, Inc.*

Reg. No. 1,096,135. (See Reg. No. 905,126.)

Reg. No. 1,097,167. (See Reg. No. 864,688.)

Reg. No. 1,098,210. (See Reg. No. 905,126.)

Reg. No. 1,103,578. (See Reg. No. 864,688.)

Reg. No. 1,104,537. (See Reg. No. 646,221.)

Reg. No. 1,107,599. (See Reg. No. 646,221.)

Reg. No. 1,113,392 (ABM), ABM Office Supply Co., Inc., **filed** July 12, 1982, D.C., M.D. Fla. (Tampa), Doc. 82-0770 CIV T H, *ABM Office Supply Co., Inc.* v. *Leslie J. Kramer, et al.*

Reg. No. 1,114,293. (See Reg. No. 1,017,548.)

Reg. No. 1,115,789. (See Reg. No. 963,828.)

Reg. No. 1,121,614 (RADIO CITY MUSIC HALL AND DESIGN), Rockefeller Center, Inc.; **Reg. No. 1,121,615** (RADIO CITY MUSIC HALL), **same, filed** July 27, 1982, D.C., S.D.N.Y., Doc. 82-Civ-4880 (MEL), *Rockefeller Center, Inc.* v. *Penucci, Inc.*

Reg. No. 1,121,615. (See Reg. No. 1,121,614.)

Reg. No. 1,122,022. (See Reg. No. 761,091.)

Reg. No. 1,122,403 (VENT), Corona Hair Net Corp., **filed** Mar. 8, 1982, D.C., C.D. Calif. (Los Angeles), Doc. CV-82 1141 WMB, *Corona Hair Net Corp.* v. *Devon, et al.*

Reg. No. 1,125,658 (BIG BEN'S), Integrity Entertainment Corp., **filed** Feb. 9, 1982, D.C., E.D. Mich. (Ann Arbor), Doc. 82-60037, *Integrity Entertainment Corp.* v. *WHR, Inc.*

Reg. No. 1,126,269. (See Reg. No. 925,654.)

Reg. No. 1,133,886. (See Reg. No. 646,221.)

Reg. No. 1,135,217. (See Reg. No. 676,630.)

Reg. No. 1,137,050. (See Reg. No. 714,826.)

Reg. No. 1,144,541. (See Reg. No. 1,079,083.)

Reg. No. 1,160,868. (See Reg. No. 905,126.)

Reg. No. 1,161,351 (FREEPORT FLING AND DESIGN), Wainwright's Travel Service, Inc., **filed** July 23, 1982, D.C., E.D. Pa. (Philadelphia), Doc. 82-3201, *Wainwright's Travel Services, Inc.* v. *Hawaiian Fling, Inc., et al.*

Reg. No. 1,164,917 (CENTURY 21 AND DESIGN), Century 21 Real Estate Corp., **filed** July 9, 1982, D.C. Md. (Baltimore), Doc. B-82-1937, *Century 21 Real Estate Corp., etc.* v. *Century Associates, Inc., etc.,*

Reg. No. 1,169,496. (See Reg. No. 905,126.)

Reg. No. 1,170,332 (SV AND DESIGN), Englishtown Sportswear Ltd., **filed** Feb. 17, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 0765 CCH, *Englishtown Sportswear Ltd.* v. *Tiffany Jade, Inc., et al.*

Reg. No. 1,182,575 (LANDMARK), Signal Landmark, Inc., **filed** July 14, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 3439, *Signal Landmark, Inc.* v. *William J. Lindstrom, Inc., doing business as Landmark Associates.*

Reg. No. 1,185,873 (UCLA AND DESIGN), The Regents of the University of California; **Reg. No. 1,185,874** (UCLA), **same, filed** July 1, 1982, D.C., C.D. Calif. (Los

Angeles), Doc. 82 3267, *The Regents of the University of California* v. *Champion Products, Inc.*

Reg. No. 1,185,874. (See Reg. No. 1,185,873.)

Reg. No. 1,195,878 (DRYCLEAN-U.S.A. AND DESIGN), Dryclean U.S.A., Inc., **filed** Nov. 12, 1980, D.C., S.D. Tex. (Houston), Doc. H-80-2553, *Dryclean U.S.A., Inc.* v. *Dean Lee.*

Reg. No. 1,195,913 (PARROT JUNGLE), Parrot Jungle, Inc., **filed** Jan. 9, 1981, D.C., S.D.N.Y., Doc. 81-Civ-0100, *Parrot Jungle, Inc. (Fla.)* v. *Parrot Jungle, Inc. (N.Y.).*

Reg. No. 1,196,034. (See Reg. No. 923,423.)

Reg. No. 1,196,770 (FOLIO AND DESIGN), Saks & Co.; **Reg. No. 1,197,035, same, filed** Aug. 20, 1980, D.C., S.D.N.Y., Doc. 80-Civ-4800 (LPG), *Saks & Co., et al* v. *FHI Ffolio, Inc.* Plaintiff is the owner of Reg. Nos. 1,196,770 and 1,197,035 which are valid. Defendant is permanently enjoined from further infringing Plaintiff's trademarks. Filed Mar. 26, 1981.

Reg. No. 1,197,035. (See Reg. No. 1,196,770.)

Reg. No. 1,201,179 (VITTORIO RICCI), ETF Enterprises, Inc., **filed** Aug. 24, 1979, D.C., S.D.N.Y., Doc. 79-Civ-4489 LWP, *ETF Enterprises, Inc.* v. *Nina Ricci S.A.R.L.*

Patents Available for License or Sale

Re. 30,930. GLAZING STRIP AND METHOD. *Martine Tractenburg,* 14 Candlewood La., Avon, Ct. 06001.

3,392,127. COMPOSITION OF POLYESTER RESIN AND SODIUM SILICATE. Inquires should be directed to: *Michael I, Wofson, Blum, Kaplan, Friedman, Silberman & Beran,* 730 Third Ave. New York, N.Y. 10017. (212) 867-2200.

3,676,664. WORK AND SAFETY LIGHT. *P. Corvetti,* 12 Waverly Pl., Rockville Centre, N.Y. 11570.

4,064,999. ADJUSTABLE BUILDING PANEL SCAFFOLD. *Simon Young,* 520 Railroad St., Mamou, La. 70554.

4,136,764. MOTHER ALICE'S BREAD VENDING MACHINE. *Alice Johnson,* 8650 Belford Ave. #1, Los Angeles, Ca. 90045, (213) 645-4476.

4,154,444. GAME BOARD. *Nathan D. Grenell,* 815 Hanson St., Whitehall, Mich. 49461, (616) 894-6350.

4,251,950. ELECTRONIC SILVICIDAL APPARATUS FOR KILLING BRUSH. *Doyle Nutt,* P.O. Box 693, Fayetteville, Ariz. 72702.

4,255,697. CASH REGISTER POWER SUPPLY SYSTEM. *James A. Oliff, Stevens, Davis, Miller & Mosher,* 1911 Jefferson Davis Hwy., Suite 600, Crystal Mall 1, Arlington, Va., 22202, 703-920-8900.

4,275,536. WALL ELEMENT FOR A CONSTRUCTION WALL. *Karl H. Vahlbrauk,* Kriegerweg 1 D-3353 Bad Gandersheim, Germany. Correspondence to: *Michael J. Striker,* 360 Lexington Ave., New York, N.Y. 10017.

4,293,421. METHOD & EQUIPMENT FOR A WRAP-AROUND UPFLOW SUBMERGED ANAEROBIC. *A. W. Green,* P. E. Civil/Sanitary, 7310-85th St., N. W., Gig Harbor, Wash., 98335.

4,299,268. AUTOMATICALLY CONTROLLED CASTING PLANT *James A. Oliff, Stevens, Davis, Miller, & Mosher,* 1911 Jefferson Davis Hwy., Suite 600, Crystal Mall 1, Arlington, Va. 22202, 703-920-8900.

4,316,594. FORMWORK PANEL FOR CONCRETE WALLS. Correspondence to: *Murray Schaffer,* 875 Ave. of the Americas, New York, N.Y. 10001.

4,317,457. ELECTROCONDUCTING CAST FORMING A CUTANEOUS ELECTRODE FOR APPLYING ELECTRICAL CURRENTS TO THE HUMAN BODY FOR THERAPEUTIC OR AESTHETIC TREATMENT AND METHOD OF USING SUCH ELECTROCONDUCTING CAST. *Jacqueline Guillot.* Correspondence to: *Neil F. Greenblu,* 701 South 23rd St., Arlington, Va. 22202.

4,319,748. SPORT TRAINING DEVICE. *Efim Alter* 7533 Horrocks, St., 1st Floor, Philadelphia, Pa. 19152.

4,322,483. METHOD OF UTILIZING EMPTY ALUMINUM BEVERAGE CANS TO PROVIDE AN ENERGY SOURCE. *Harold S. Tune,* Salu/Cell, P.O. Box 1174, Morro Bay, Ca. 93442.

4,328,662. MULTIPLY TWISTING MACHINE FOR HIGH SPEED HELICAL WINDING OF UNITARY STRANT TO FORM A CABLE. *Pierre Bretegnier, et al.* Correspondence to: *Neil F. Greenblum,* 701 South 23rd St., Arlington, Va. 22202, (703) 521-7800.

4,337,602. ENCLOSURE. *Richard P. King* P.O. Box 1037, Wappingers Falls, N.Y., 12590.

4,341,730. BEAM DANCER FUSION DEVICE. *Maier Solar Developments, Henry B. Maier,* 6 Sealey Ave., 3K, Hempstead, N.Y. 11550.

The RCA Corp. offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corp., Sr. Vice President, Licensing, 30 Rockefeller Plz., New York, N.Y. 10020.

D. 264,712. VIDEO DISC PLAYER.

D. 264,713. VIDEO DISC PLAYER.

4,332,077. METHOD OF MAKING ELECTRICALLY PROGRAMMABLE CONTROL GATE INJECTED FLOATING GATE SOLID STATE MEMORY TRANSISTOR.

4,332,841. MOLD PREPARATION METHOD.

4,332,999. METHOD FOR MACHINING A WORKPIECE WITH A BEAM OF RADIANT ENERGY ASSISTED BY A CHEMICALLY-REACTIVE GAS.

4,333,031. PHOTOMULTIPLIER TUBE HAVING DIRECTIONAL ALKALI METAL VAPOR EVAPORATION MEANS.

4,333,051. METHOD AND APPARATUS FOR DETERMINING MINORITY CARRIER DIFFUSION LENGTH IN SEMICONDUCTORS.

4,333,057. DIFFERENTIAL-INPUT COMPLEMENTARY FIELD-EFFECT TRANSISTOR AMPLIFIER.

4,333,058. OPERATIONAL AMPLIFIER EMPLOYING COMPLEMENTARY FIELD-EFFECT TRANSISTORS.

4,333,099. USE OF SILICIDE TO BRIDGE UNWANTED POLYCRYSTALLINE SILICON P-N JUNCTION.

4,333,107. JAM-RESISTANT TV SYSTEM.

4,333,174. TRANSDUCER DISPLACEMENT APPARATUS FOR VIDEO DISC PLAYER.

4,333,592. APPARATUS FOR HANDLING DEFORMABLE COMPONENTS SUPPORTED IN A MATRIX.

4,334,196. AMPLIFIER USING LATERAL AND VERTICAL TRANSISTORS.

4,334,198. BIASING OF TRANSISTOR AMPLIFIER CASCADES.

4,334,237. ADAPTIVE AMPLITUDE AVERAGING FOR WEIGHTING QUANTIZING NOISE.

4,334,267. FREE-RUNNING PUSH-PULL INVERTER.

4,334,324. COMPLEMENTARY SYMMETRY FET FREQUENCY CONVERTER CIRCUITS.

4,334,347. METHOD OF FORMING AN IMPROVED GATE MEMBER FOR A GATE INJECTED FLOATING GATE MEMORY DEVICE.

4,334,427. TESTING THE CONDITION OF A TURBOCHARGER.

4,334,829. SPUTTER-ION PUMP FOR USE WITH ELECTRON TUBES HAVING THORIATED TUNGSTEN CATHODES.

4,334,849. APPARATUS FOR MOLDING A RECORDED DISC.

4,334,945. METHOD AND DEVICE FOR SEPARATING PARTS FROM A STRIP OF MATERIAL.

4,334,948. METHOD OF AN APPARATUS FOR GROWING CRYSTAL RIBBON.

4,335,332. FOCUS MESH STRUCTURE AND BIASING TECHNIQUE FOR FLAT PANEL DISPLAY DEVICES.

4,335,335. TELEVISION RECEIVER HIGH VOLTAGE PROTECTION CIRCUIT.

4,335,360. CLASS AB PUSH-PULL AMPLIFIERS.

4,335,366. COLOR TELEVISION DISPLAY SYSTEM HAVING IMPROVED CONVERGENCE.

4,335,394. CROSSTALK FILTERING ARRANGEMENT WITH VARIABLE FREQUENCY FILTERING TO REMOVE EFFECTS OF FM CARRIER.

4,335,401. RAPID CORRELATION OF RECORDED INFORMATION.

4,335,402. INFORMATION TRANSMISSION DURING FIRST-EQUALIZING PULSE INTERVAL IN TELEVISION.

4,335,408. DIGITAL TRACKING SYSTEM.

4,335,411. LENGTH COUNTER FOR WEB TRANSPORT SYSTEM.

4,335,412. TRIAX SAFETY CIRCUIT.

4,335,470. AUDIO DE-EMPHASIS CIRCUIT.

4,335,544. STONE-POSITIONING APPARATUS AND METHOD.

4,335,926. METHOD FOR VAPORIZING GETTER MATERIAL IN A SUCCESSION OF CATHODE-RAY TUBES.

4,336,540. RADAR SYSTEM.

4,336,550. CMOS DEVICE WITH SILICIDED SOURCES AND DRAINS AND METHOD.

4,336,555. VIDEO ACCESSORY HAVING CHANNEL IDENTIFIER.

4,336,615. LINEAR LOADING FOR PWM FILTER.

4,337,423. DUAL OUTPUT SWITCHING CIRCUIT.

4,337,478. COMPOSITE TIMING SIGNAL GENERATOR WITH PREDICTABLE OUTPUT LEVEL.

4,337,522. MEMORY CIRCUIT WITH MEANS FOR COMPENSATING FOR INVERSION OF STORED DATA.

4,337,536. FLYLEAD FOR A VIDEO DISC STYLUS CARTRIDGE.

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Application for license may be addressed to: Patent Counsel, Industrial and Marine Steam Turbine Division, General Electric Co., 1100 Western Ave., Lynn, Mass. 01910.

4,323,109. OPEN CYCLE HEAT PUMP SYSTEM AND PROCESS FOR TRANSFERRING HEAT.

Applications for license may be addressed to: Patent Counsel, General Electric Co., Mobile Radio Products Department, Mountain View Rd., Lynchburg, Va. 24502.

4,321,481. RECURSIVE CHARGE TRANSFER FILTER WITH A TRANSMISSION ZERO AT ZERO FREQUENCY.

Applications for license may be addressed to: Patent Counsel, Gas Turbine Division, General Electric Co., 1 River Rd., Bldg. 500, Room 218, Schenectady, N.Y. 12345.

4,328,285. METHOD OF COATING A SUPERALLOY SUBSTRATE, COATING COMPOSITIONS, AND COMPOSITES OBTAINED THEREFROM.

Applications for license may be addressed to: Group Patent Counsel, Major Appliance Business Group, General Electric Co., Appliance Park, Louisville, Ky. 40225.

Des. 260,226. WALL MOUNTABLE MICROWAVE OVEN.

3,312,087. AUTOMATIC WASHING MACHINE.

3,436,838. IMPROVED DRYER CONTROL.

3,565,553. HERMETIC COMPRESSOR UNIT.

3,602,406. ICE DISPENSER FOR A HOUSEHOLD REFRIGERATOR.

3,602,441. COMBINATION ICE CUBE AND CRUSHED ICE DISPENSER.

3,639,177. FERROUS METAL SUBSTRATE WITH DENSE, BLACK GLOSSY OXIDE COATING AND PROCESS PREPARATION.

3,640,088. HOUSEHOLD REFRIGERATOR INCLUDING EXTERIOR ICE SERVICE.

3,680,328. AIR CONDITIONER.

3,736,916. SELF-CLEANING OVEN DOOR STRUCTURE.

3,757,544. CENTRIFUGALLY RESPONSIVE DISPENSER FOR WASHING MACHINE.

3,766,973. CONTROL CIRCUIT FOR HEATING AND COOLING APPARATUS.

3,767,328. ROTARY COMPRESSOR WITH CAPACITY MODULATION.

3,785,166. ROOM AIR CONDITIONER FROST PROTECTION WITH BIMETAL CONTROL THERMOSTAT.

3,805,562. TREATING AGENT DISPENSER.

3,807,419. DISHWASHER HAVING MEANS FOR COLLECTING AND REMOVING FOOD SOIL.

3,820,351. AIR CONDITIONER GRILLE ASSEMBLY.

3,854,219. ELECTRONIC DRYER.

3,861,769. DISHWASHER RACK.

3,871,443. SAFETY CONTROL FOR A REMOTE CONTROL SYSTEM.

3,902,331. ICE DISPENSING SYSTEM OF A HOUSEHOLD REFRIGERATOR.

3,937,641. METHOD OF ASSEMBLING ADHESIVE JOINT.

3,967,489. METHOD OF FORMING CONSTRUCTION IN TUBING.

3,975,920. AIR CONDITIONER DAMPER CONTROL.

4,013,870. TERMINAL BLOCK MOUNTING FOR A PLUG-IN SURFACE HEATING UNIT.

Re. 30,745. REVERSE CYCLE HEAT PUMP CIRCUIT (Reissue of 4,057,977).

4,059,325. TERMINAL PROTECTION SHIELD.

4,065,027. HINGE ARRANGEMENT FOR ROOM AIR CONDITIONER ACCESS.

4,066,094. COMBINATION DRAIN SUMP AND AIR PRESSURE CHAMBER FOR AUTOMATIC CLOTHES WASHING MACHINE.

4,069,425. FULL-TIME FLOOD PROTECTION CONTROL FOR DISHWASHER.

4,069,545. DOOR CONTROL DEVICE WITH CLOSURE REGULATOR.

4,070,204. LOW-ENERGY DISHWASHER.

4,102,391. HEAT PUMP FROST CONTROL SYSTEM.

4,149,654. DISHWASHER MULTIPLE ADDITIVE DISPENSING APPARATUS.

4,149,655. DISHWASHER ADDITIVE DISPENSER HAVING A TIMER CONTROLLED CAM MECHANISM.

4,149,656. DISHWASHER ADDITIVE DISPENSING APPARATUS HAVING A MOVABLE MEASURING CUP.

4,149,657. DISHWASHER ADDITIVE DISPENSING APPARATUS.

4,150,558. METHOD FOR FORMING A VARIABLE RESTRICTOR.

4,164,197. LIQUID LEVEL INDICATING DEVICE.

4,173,871. REFRIGERATION APPARATUS DEMAND DEFROST CONTROL SYSTEM AND METHOD.

4,175,409. CLOTHES WASHING MACHINE.

4,175,617. SKEWED TURN COILED TUBE HEAT EXCHANGER FOR REFRIGERATOR EVAPORATORS.

4,178,765. MEANS FOR CAUSING THE ACCUMULATION OF REFRIGERANT IN A CLOSED SYSTEM.

4,179,821. DISHWASHER VENT ARRANGEMENT.

4,181,773. PROCESS FOR RENDERING SURFACES PERMANENTLY WATER WETTABLE AND NOVEL PRODUCTS THUS-PRODUCED.

4,184,342. VARIABLE RESTRICTOR FOR A REFRIGERATION SYSTEM.

4,191,245. HEAT DISSIPATING MOTOR MOUNTING ARRANGEMENT.

4,313,044. SLOT CONFIGURATION FOR CHOKE SEAL.

4,316,069. MICROWAVE OVEN EXCITATION SYSTEM.

4,317,516. DEVICE AND METHOD FOR SHIPPING APPLIANCES.

4,318,165. RESONANT-FLYBACK POWER SUPPLY WITH FILAMENT WINDING FOR MAGNETRON AND THE LIKE LOADS.

4,319,109. CENTERED UTENSIL SENSOR FOR INDUCTION SURFACE UNITS.

4,320,636. MECHANISM FOR ORBITING WASHER.

4,321,577. INTEGRAL HUMIDITY SENSOR/HEATER CONFIGURATIONS.

4,321,809. WASHING MACHINE.

4,324,968. MICROWAVE OVEN CAVITY EXCITATION SYSTEM PROVIDING CONTROLLED ELECTRIC FIELD SHAPE FOR UNIFORMITY OF ENERGY DISTRIBUTION.

4,325,178. SCREW ANCHORING DEVICE AND METHOD.

4,326,390. APPARATUS AND METHOD FOR THAWING FROZEN FOOD.

4,328,600. WASHING MACHINE.

4,329,557. MICROWAVE OVEN WITH IMPROVED ENERGY DISTRIBUTION.

4,329,859. BASKET MOUNTING ARRANGEMENT FOR A WASHING MACHINE.

4,332,142. HOUSEHOLD REFRIGERATOR INCLUDING ANTISWEAT HEATER CONTROL CIRCUIT.

4,332,152. WASHING MACHINE.

4,333,323. WASHING MACINE.

4,333,588. ICE DISPENSER ASSEMBLY.

4,334,132. SWITCH WITH SHAFT POSITIONING ARRANGEMENT.

4,334,135. UTENSIL LOCATION SENSOR FOR INDUCTION SURFACE UNITS.

4,334,147. POWER CONTROL FOR APPLIANCE USING HIGH INRUSH CURRENT ELEMENT.

4,336,434. MICROWAVE OVEN CAVITY EXCITATION SYSTEM EMPLOYING CIRCULARLY POLARIZED BEAM STEERING FOR UNIFORMITY OF ENERGY DISTRIBUTION AND IMPROVED IMPEDANCE MATCHING.

4,192,564. LOAD EQUALIZING SUPPORT SYSTEM.

4,193,275. AGITATOR MECHANISM FOR CLOTHES WASHING MACHINE.

4,196,330. COMBINATION OVEN FULLY UTILIZING THE CURRENT-SUPPLYING CAPABILITY OF A POWER SOURCE.

4,196,628. PORTABLE PSYCHROMETRIC TEST APPARATUS AND METHOD FOR AIR CONDITIONING EQUIPMENT.

4,198,222. CONDENSATION PREVENTING ARRANGEMENT FOR INTERIOR OF A HOUSEHOLD REFRIGERATOR.

4,198,553. COMBINATION OVEN FULLY UTILIZING THE CAPABILITY OF A LIMITED POWER SOURCE.

4,200,829. CIRCUIT FOR PROTECTING INDUCTION MOTORS.

4,204,204. ON/OFF SWITCH ARRANGEMENT FOR A TOUCH CONTROL BAR GRAPH DEVICE.

4,205,533. REFRIGERATOR HAVING A CONTROL INDICATOR OPTIC ARRANGEMENT AND METHOD.

4,207,760. VANE ARRANGEMENT FOR CLOTHES WASHING MACHINE.

4,209,999. HOUSEHOLD REFRIGERATOR WITH THROUGH-THE-DOOR ICE SERVICE.

4,244,637. TRACK ASSEMBLY.

4,262,532. PRESSURE AND TEMPERATURE SENSOR.

4,282,422. POWER CONTROL FOR APPLIANCE USING MULTIPLE HIGH INRUSH CURRENT ELEMENTS.

4,290,052. CAPACITIVE TOUCH ENTRY APPARATUS HAVING HIGH DEGREE OF PERSONAL SAFETY.

4,290,481. ELECTRONIC THERMOSTATIC CONTROL FOR A HEAT/COOL ROOM AIR CONDITIONING SYSTEM.

4,291,303. TOUCH PAD AND DISPLAY TUBE CIRCUITRY.

4,296,297. DRIVE ARRANGEMENT FOR MICROWAVE OVEN MODE STIRRER.

4,297,852. REFRIGERATOR DEFROST CONTROL WITH CONTROL OF TIME INTERVAL BETWEEN DEFROST CYCLES.

4,298,789. OVEN HAVING A CAVITY HEATED BY AT LEAST ONE MONOLITHIC INTEGRATED HEAT SOURCE.

4,301,347. FEED SYSTEM FOR MICROWAVE OVEN.

4,301,509. METHOD FOR COOKING MEAT OR POULTRY IN THERMAL OVEN.

4,301,829. FLOOD CONTROL FOR A DISHWASHER.

4,306,423. FLEXIBLE TRAY TYPE ICE MAKER.

4,306,757. REFRIGERATOR INCLUDING THROUGH-THE-DOOR ICE SERVICE.

4,311,351. REFRIGERATOR CABINET CONSTRUCTION.

Applications for license may be addressed to: Patent Counsel Aerospace Electronic Systems Department General Electric Co. 901 Broad St. MD 410 Utica, N.Y. 13503.

U.S. 4,178,519. CHARGE TRANSFER APPARATUS.

U.S. 4,178,522. INFRARED DETECTION APPARATUS.

U.S. 4,182,010. ELECTRON BEAM MATRIX DEFLECTOR AND METHOD OF FABRICATION.

U.S. 4,185,318. METHOD AND APPARATUS FOR PROVIDING SURFACE CHARGE MEMORIES.

U.S. 4,196,373. ELECTRON OPTICS APPARATUS.

U.S. 4,197,144. METHOD FOR IMPROVING WRITING OF INFORMATION IN MEMORY TARGETS.

U.S. 4,212,082. METHOD FOR FABRICATION OF IMPROVED STORAGE TARGET AND TARGET PRODUCED THEREBY.

U.S. 4,217,586. CHANNEL ESTIMATING REFERENCE SIGNAL PROCESSOR FOR COMMUNICATION SYSTEM ADAPTIVE ANTENNAS.

U.S. 4,218,635. ELECTRON GUN WITH STATIONARY BEAM DURING BLANKING.

U.S. 4,224,552. IMPROVED MAGNETIC FINE DEFLECTION SYSTEM FOR MATRIX LENS ELECTRON OPTICS.

U.S. 4,240,089. LINEARIZED CHARGE TRANSFER DEVICES.

U.S. 4,254,383. INVERTED MICROSTRIP PHASE SHIFTER.

U.S. 4,288,858. INVERSE TWO-DIMENSIONAL TRANSFORM PROCESSOR.

U.S. 4,293,920. TWO DIMENSIONAL TRANSFORM PROCESSOR.

U.S. 4,300,108. ELECTRICAL ATTENUATOR.

U.S. 4,305,288. TEMPERATURE SENSING CIRCUIT.

U.S. 4,326,269. ONE BIT MEMORY FOR BIPOLAR SIGNALS.

Applications for license may be addressed to: Division Patent Counsel Power Delivery Division, General Electric Co. 6901 Elmwood Ave., Philadelphia, Pa. 19142.

Re. 28,604. GAS SHIELD FOR LOAD-BREAK CABLE TERMINATIONS. Patented on Nov. 4, 1975 on an application of E. J. Kotski.

3,955,874. SHIELDED POWER CABLE SEPARABLE CONNECTOR MODULE HAVING A CONDUCTIVELY COATED INSULATING ROD FOLLOWER. Patented on May 11, 1976 on an application of V. J. Boliver.

3,982,812. POWER CABLE SEPARABLE CONNECTOR HAVING GASKET MEANS FOR RESTRICTING THE FLOW OF ARC-GENERATED GASES THEREFROM. Patented on Sept. 28, 1976 on an application of V. J. Boliver.

3,997,235. SHIELDED POWER CABLE SEPARABLE CONNECTOR MODULE WITH SNUFFER LINER HAVING REDUCED ARC-QUENCHING GAS GENERATING PORTION. Patented on Dec. 14, 1976 on an application of V. J. Boliver.

4,119,358. ELECTRICAL CONNECTOR SWITCHING MODULE. Patented on Oct. 10, 1978 on an application of H. N. Tachick, et al.

4,170,394. HIGH VOLTAGE SEPARABLE CONNECTOR SYSTEM WITH MODIFIED DWELL POSITION. Patented on Oct. 9, 1979 on an application of G. V. Conway.

4,199,213. METHOD OF CONSTRUCTING AN ELECTRICAL CONNECTOR SWITCHING MODULE. Patented on Apr. 22, 1980 on an application of H. N. Tachick.

4,300,181. COMMUTATION CIRCUIT FOR AN HVDC CIRCUIT BREAKER. Patented on Nov. 10, 1981 on an application of W. J. Premerlani.

Applications for license may be addressed to: Patent Counsel, Transportation Systems Business Operations, General Electric Co., 2901 East Lake Rd., Erie, Pa. 16531.

Re. 29,579. DUAL SOURCE AUXILIARY POWER SUPPLY.

3,999,111. GATING SIGNAL CONTROL FOR A PHASE-CONTROLLED RECTIFIER CIRCUIT.

3,566,010. HEAVY-DUTY INSULATING SUPPORT CONNECTOR.

3,572,968. TURBINE BUCKET COVER.

3,652,881. GENERATOR VENTILATION DOME AND COOLER CASING CONSTRUCTION.

3,693,036. LIQUID COOLED SERIES LOOP CONNECTOR.

3,808,489. COOLED FLUX SHIELD FOR GENERATOR TERMINAL BOX.

3,864,803. CARTRIDGE BRUSH HOLDER.

4,030,019. STATIC INVERTER CONTROL CIRCUIT.

4,080,845. SHAPED DISC FLYWHEEL.

4,032,874. REACTOR CORE.

4,095,154. REGENERATIVE BRAKING SYSTEM FOR A CHOPPER CONTROLLED ELECTRIC TRACTION MOTOR.

4,102,221. CROSS-PLY COMPOSITE FLYWHEEL.

4,256,982. ELECTRIC PULSE SHAPING CIRCUIT.

4,256,983. VOLTAGE-TO-FREQUENCY CONVERTER HAVING A CONSTANT FREQUENCY MODE OF OPERATION.

4,284,936. CHOPPER TYPE PROPULSION SYSTEM WITH LOW SPEED ELECTRICAL BRAKING CAPABILITY FOR TRACTION VEHICLES.

4,284,938. CHOPPER WITH ADAPTIVE ENERGY COMMUTATION.

4,301,899. SYSTEM FOR AUTOMATICALLY CONTROLLING AN ELECTRICALLY PROPELLED TRACTION VEHICLE TRAVERSING A GAP IN WAYSIDE SOURCE OF POWER.

4,321,478. AUXILIARY POWER SUPPLY WITH KINETIC ENERGY STORAGE.

4,322,668. POWER CONTROL OF A STALLING MOTOR.

Patents Withdrawn from Availability for Licence or Sale

General Electric Co., Large Steam Turbine-Generator Division, Schenectady, N.Y., hereby withdraws the following patents from the Register of Patents Available for Licensing.

3,118,015. BALANCED TRANSPOSITION FOR STRANDED CONDUCTOR WITH ASYMMETRICALLY DISPOSED STRAND ENDS.

3,135,888. STRUCTURE FOR RETAINING GENERATOR END WINDINGS.

3,158,770. ARMATURE BAR VIBRATION DAMPING ARRANGEMENT.

3,225,231. GAS COOLED END WINDING FOR DYNAMOELECTRIC MACHINE ROTOR.

3,292,025. DYNAMOELECTRIC MACHINE ROTOR END WINDING.

3,307,252. METHOD FOR PROVIDING A NARROW FLANGE ON A LARGE ROTOR FORGING.

3,348,081. GAP PICKUP ROTOR WITH GAS SEGREGATING BAFFLES.

3,349,264. FIELD COIL CONNECTION FOR FOUR-POLE ROTORS.

3,387,155. REMOVABLE BRUSH MAGAZINE ARRANGEMENT.

3,408,517. MULTIPLE CIRCUIT WINDING PATTERNS FOR POLYPHASE DYNAMOELECTRIC MACHINES.

3,432,708. REMOVABLE BRUSH ASSEMBLY.

3,437,859. WINDING SUPPORT STRUCTURE FOR A DYNAMOELECTRIC MACHINE.

3,461,330. DYNAMOELECTRIC MACHINE STATOR CORE BAFFLE.

3,476,964. MULTIPLE CIRCUIT ARMATURE WINDING FOR POLYPHASE DYNAMOELECTRIC MACHINES.

3,531,667. LOW FREQUENCY STATOR FRAMES FOR DYNAMOELECTRIC MACHINES.

3,564,391. ROTATING ALTERNATING CURRENT GENERATOR SYSTEM.

PATENT NOTICES

Certificates of Correction for the Week of Sept. 21, 1982

Re. 30,924	4,296,323	4,327,001	4,335,730
D. 262,821	4,297,865	4,327,009	4,335,888
D. 264,367	4,300,912	4,327,046	4,335,937
D. 265,667	4,301,057	4,327,092	4,335,983
3,856,631	4,301,188	4,327,213	4,336,118
3,945,515	4,303,074	4,328,121	4,336,639
3,972,415	4,303,646	4,328,125	4,336,759
3,997,053	4,305,657	4,328,227	4,336,905
4,010,551	4,305,729	4,328,602	4,337,050
4,049,141	4,307,250	4,329,023	4,337,062
4,091,090	4,307,379	4,329,201	4,337,138
4,100,130	4,309,135	4,329,218	4,337,261
4,122,304	4,309,498	4,329,328	4,337,481
4,142,203	4,311,640	4,329,422	4,337,583
4,150,222	4,315,238	4,329,918	4,337,692
4,157,174	4,317,113	4,330,039	4,337,855
4,159,358	4,317,127	4,330,092	4,337,896
4,159,976	4,317,369	4,330,097	4,337,955
4,163,081	4,318,490	4,330,677	4,338,377
4,171,838	4,318,730	4,330,804	4,338,393
4,174,946	4,318,845	4,331,001	4,338,678
4,201,299	4,319,117	4,331,091	4,339,002
4,211,634	4,319,276	4,331,205	4,339,727
4,213,496	4,319,923	4,331,380	4,340,025
4,215,598	4,321,654	4,331,393	4,340,212
4,215,787	4,321,705	4,331,477	4,340,388
4,218,378	4,321,748	4,331,543	4,340,569
4,229,210	4,322,077	4,331,711	4,340,582
4,234,972	4,322,388	4,332,225	4,340,687
4,247,019	4,322,579	4,332,243	4,340,744
4,249,304	4,322,818	4,332,246	4,340,886
4,251,207	4,323,066	4,332,824	4,340,928
4,253,376	4,323,422	4,332,965	4,341,025
4,258,162	4,324,827	4,333,017	4,341,203
4,265,972	4,324,871	4,333,946	4,341,250
4,266,980	4,325,445	4,334,003	4,341,485
4,268,295	4,325,853	4,334,309	4,341,797
4,272,925	4,325,946	4,334,694	4,341,832
4,280,011	4,325,956	4,335,013	4,341,846
4,285,202	4,326,118	4,335,048	4,342,026
4,287,330	4,326,745	4,335,122	4,342,027
4,290,452	4,326,797	4,335,216	4,342,164
4,292,572	4,326,843	4,335,304	
4,293,429	4,326,971	4,335,594	

Disclaimers

4,134,131.—*Robert S. Hopkins, Jr.,* Marlton, N. J. DIGITAL VIDEO SYNCHRONIZER. Patent dated Jan. 9, 1979. Disclaimer filed Mar. 8, 1982, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to all claims of said patent.

4,140,977.—*Adel A. A. Ahmed,* Annandale, N. J. SIGNAL TRANSLATION CIRCUITS. Patent dated Feb. 20, 1979. Disclaimer filed Sept. 26, 1979, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claims 12 and 19 of said patent.

4,161,012.—*Francis V. Cunningham,* Western Springs, Ill. HIGH VOLTAGE PROTECTION APPARATUS. Patent dated July 10, 1979. Disclaimer filed Feb. 11, 1982, by the assignee, *Joslyn Mfg. and Supply Co.*

Hereby enters this disclaimer to claims 15 through 21, inclusive, and claim 52 of said patent.

4,161,012—*Francis V. Cunningham,* Western Springs, Ill. HIGH VOLTAGE PROTECTION APPARATUS. Patent dated July 10, 1979. Disclaimer filed Nov. 9, 1981, by the assignee, *Joslyn Mfg. and Supply Co.*

Hereby enters this disclaimer to claims 32 and 45 of said patent.

4,163,978.—*Eric G. Shepherd* and *Roger D. Spragg,* Cheltenham, England. RADIO DIRECTION FINDING. Patent dated Aug. 7, 1979. Disclaimer filed July 27, 1982, by the assignee, *The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland.*

Hereby enters this disclaimer to claims 1, 4, 11 and 14 of said patent.

4,165,449.—*Patrick A. Vachon,* Arvada, Colo. ECHO SUPPRESSOR CIRCUIT. Patent dated Aug. 21, 1979. Disclaimer filed Sept. 11, 1981, by the assignee, *Storage Technology Corp.*

Hereby enters this disclaimer to claims 1–7 of said patent.

4,181,893.—*Edward L. Ehmke,* Margate, Fla. BATTERY SAVER FOR A TONE CODED SIGNALLING SYSTEM. Patent dated Jan. 1, 1980. Disclaimer filed Aug. 28, 1981, by the assignee, *Motorola, Inc.*

Hereby enters this disclaimer to claims 10, 18 and 19 of said patent.

4,196,358.—*John C. Conover,* Sunnyvale and *Larry J. Kendall,* San Jose, Calif. ANALOG MULTIPLEXER. Patent dated Apr. 1, 1980. Disclaimer filed June 14, 1982, by the assignee, *Fairchild Camera and Instrument Corp.*

Hereby enters this disclaimer to all claims of said patent.

4,260,599.—*Hisayoshi Okazaki,* Kyoto; *Tsuneo Kanamaru,* Takatsuki, and *Kazuhiko Ohta,* Ikeda, Japan. ANTIFIBROTIC SUBSTANCE P-1894B. Patent dated Apr. 7, 1981. Disclaimer filed July 1, 1982, by the assignee, *Takeda Chemical Industries, Ltd.*

Hereby enters this disclaimer to claim 1 of said patent.

4,279,944.—*Evangelos Trifon Laskaris,* Schenectady, N.Y. EPOXY IMPREGNATED VENTILATED WINDING. Patent dated July 21, 1981. Disclaimer filed Aug. 2, 1982, by the assignee, *General Electric Co.*

Hereby enters this disclaimer to claims 1, 10 and 11 of said patent.

Dedications

3,322,296—*Nick S. Khoury,* Chicago, Ill. EASY OPENING CONTAINER. Patent dated May 30, 1967. Dedication filed Feb. 1, 1982, by the assignee, *Continental Can Co.*

Hereby dedicates to the Public the remaining term of said patent.

4,164,037 —*Michael J. Cochran,* Richardson, and *Charles P. Grant, Jr.,* deceased, late of Dallas, by *Charles P. Grant, Sr.,* executor, Dallas, Tex. ELECTRONIC CALCULATOR OF MICROPROCESSOR SYSTEM HAVING COMBINED DATA AND FLAG BIT STORAGE SYSTEM. Patent dated Aug. 7, 1979. Dedication filed July 13, 1982, by the assignee, *Texas Instruments, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Parts 1, 3 and 4

[Docket No. 2827-167]

Revision of Patent and Trademark Fees

AGENCY: Patent and Trademark Office, Commerce

ACTION: Final Rule.

SUMMARY: The Patent and Trademark Office is amending the rules of practice in patent and trademark cases to establish procedures for the payment of fees under §41(a) and (b) of Title 35, United States Code, which are reduced by 50 per centum for independent inventors and nonprofit organizations as required by the public law resulting from H.R. 6260. This action is necessary at this time in order that the procedures for paying the reduced fees will be effective on October 1, 1982, the effective date of the changes in the amounts of Patent and Trademark Office fees established by the public law resulting from H.R. 6260. This final rule also deletes Parts 3 and 4 which contain outdated sample forms and corrects a reference to a section which appears in §1.451.

EFFECTIVE DATE: October 1, 1982.

FOR FURTHER INFORMATION CONTACT:

As to the patent rules contact R. Franklin Burnett by telephone at (703) 557-3054 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: R. Franklin Burnett, Room 3-11A13, Washington, D. C. 20231.

As to the trademark rules contact Miss Maude Williams by telephone at (703) 557-2222 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: Miss Maude Williams, Room 3-11C17, Washington, D. C. 20231.

SUPPLEMENTARY INFORMATION:

Notices of proposed rulemaking relating to the revision of patent and trademark fees were published in the Federal Register on June 28, 1982, at 47 FR 28042-28065 and in the Official Gazette on June 29, 1982, at 1019 O.G. 57-120. Oral hearings were held on July 9, 1982. Full consideration has been given to all of the letters, statements, and testimony received at the time. A final rule on "Revision of Patent and Trademark Fees" was published on July 30, 1982 at 47 FR 33086-33112 with corrections in the printing thereof being published on August 4, 1982, at 47 FR 33688 and on August 5, 1982, at 47 FR 33959. The final rule was also published in the Official Gazette on August 10, 1982, at 1021 O.G. 19-94. In view of comments received at the hearings, additional time for comment on the rules covered by this change was given until August 13, 1982. The notice extending the time for comment was published on July 27, 1982 at 47 FR 32458.

This final rule is being adopted as soon as possible after the enactment of the public law resulting from H.R. 6260. The Patent and Trademark Office has determined that the requirement of 5 U.S.C. 553(d) for publication not less than 30 days before its effective date does not apply to this final rule since it will reduce patent fees for independent inventors and nonprofit organizations.

Objectives of Rule Changes

These rule changes are designed to implement the Patent and Trademark Office fees and procedures which are provided for by the public law resulting from H.R. 6260.

Public Law Resulting From H.R. 6260

The public law resulting from H.R. 6260 provides that funds available under the act "shall be used to reduce by 50 per centum the payment of fees under section 41(a) and (b) of Title 35, United States Code" by independent inventors, small business concerns, and nonprofit organizations. The public law resulting from H.R. 6260 gives the Commissioner authority to establish regulations defining independent inventors and nonprofit organizations. The public law resulting from H.R. 6260 defines small business concerns by reference to §3 of the Small Business Act and regulations established by the Small Business Administration. This rulemaking establishes regulations defining independent inventors and nonprofit organizations. The Small Business Administration is establishing the definition of a small business concern for the purpose of paying reduced fees under the public law resulting from H.R. 6260. This rulemaking also establishes the procedures which will be followed by independent inventors and nonprofit organizations when paying the reduced fees. The procedures to be followed by small business concerns when paying the reduced fees will be established in a separate final rule.

Discussion of Specific Sections

The following sections are changed by this final rule, effective October 1, 1982:

Section 1.9, as amended, adds paragraphs (c), (e), and (f) which define "independent inventor" and "nonprofit organization" as used in Title 37, Code of Federal Regulations, Chapter I. Each of these along with "small business concern" is identified as a "small entity" for purposes of paying fees which are set under §41(a) and (b) of Title 35, United States Code, as amended by the public law resulting from H.R. 6260. Paragraph (d) of §1.9 relates to the definition of small business concern which is being established by the Small Business Administration. Accordingly, proposed paragraph 1.9(d) is not being promulgated at this time.

The public law resulting from H.R. 6260 authorizes the Commissioner to establish regulations defining independent inventors and nonprofit organizations. Section 1.9(c) defines an independent inventor as any inventor who (1) has not assigned,

granted, conveyed, or licensed, and (2) is under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who could not likewise be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization. Once an individual sole inventor, or one of several joint inventors, has assigned, granted, conveyed, or licensed, or comes under an obligation to assign, grant, convey, or license, any rights to the invention to anyone who could not likewise obtain status as a small entity, the inventor(s) will no longer be entitled to pay fees in the amounts established for an independent inventor (§1.9(c)). Section 1.9(c) will permit an individual inventor to make an assignment, grant, conveyance, or license of partial rights in the invention to another individual or individuals who could qualify as an independent inventor or inventors if they had made the invention. In addition, §1.9(c) will permit an individual inventor to make an assignment, grant, conveyance, or license of partial rights in the invention to a small business concern or nonprofit organization. Under the circumstances described in the previous two sentences the individual inventor could still qualify as an independent inventor. However, if the independent inventor assigned, granted, conveyed, or licensed, or came under an obligation to assign, grant, convey, or license, any rights to the invention to any individual or organization which could not qualify as a small entity (§1.9(f)), then the inventor would no longer qualify as an independent inventor.

Proposed section 1.9(d) relating to the definition of a small business concern is not being promulgated at this time.

Section 1.9(e) defines a nonprofit organization by utilizing and broadening the definition contained in 35 U.S.C. 201(i). The term "university or other institution of higher education" as used in §1.9(e) means an educational institution which (1) admits as regular students only persons having a certificate of graduation from a school providing secondary education, or the recognized equivalent of such a certificate, (2) is legally authorized within the jurisdiction in which it operates to provide a program of education beyond secondary education, (3) provides an educational program for which it awards a bachelor's degree or provides not less than a two-year program which is acceptable for full credit toward such a degree, (4) is a public or other nonprofit institution, and (5) is accredited by a nationally recognized accrediting agency or association. The definition of "university or other institution of higher education" as set forth herein essentially follows the definition of "institution of higher education" contained in 20 U.S.C. 1141(a). Institutions which are strictly research facilities, manufacturing facilities, service organizations, etc., are not intended to be included within the term "other institution of higher education" even though such institutions may perform an educational function or publish the results of their work.

Section 1.9(f) identifies an independent inventor, a small business concern, or a nonprofit organization as a "small entity" for purposes of paying fees set under §41(a) and (b) of Title 35, United States Code, as amended by the public law resulting from

H.R. 6260. Fees established under §41(c) or (d) of Title 35, United States Code, will not be reduced for small entities since such a reduction is not permitted or authorized by the public law resulting from H.R. 6260. Paragraphs (c), (e), and (f) of §1.9 should be read together with new §§1.27 and 1.28 which deal with establishing status as a small entity and the effect thereof.

New §1.27 provides in paragraph (a) that any person seeking to establish status as a small entity, as defined in §1.9(f) for the purpose of paying reduced fees, must file a statement to that effect prior to or with the payment of the first fee paid as a small entity. Paragraph 1.27(b) provides specifically for inventors filing statements claiming status as independent inventors. Paragraph 1.27(c) relating to claiming status as a small business concern is not being promulgated at this time, but will be the subject of a separate final rule. Paragraph 1.27(d) provides for claiming status as a nonprofit organization. Under §1.27, as long as all of the rights remain in small entities, the fees established for a small entity can be paid. This includes circumstances where the rights were divided between an independent inventor, a small business concern and a nonprofit organization or any combination thereof.

New §1.28 provides guidance as to the effect of failure to establish, or notify the Office of any change from, small entity status. Paragraph 1.28(a) provides that once status as a small entity has been established in an application or patent, the status remains in that application or patent without the filing of a further verified statement pursuant to §1.27, unless the Office is notified of a change in status. Under paragraph 1.28(a), status as a small entity in one application or patent does not affect any other application or patent except in applications filed under §1.60 where a reference is made to a verified statement in a parent application. Paragraph 1.28(b) requires that notification of any change in status resulting in loss of entitlement to small entity status be filed in the application or patent prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. Section 1.28 also provides guidance as to the effect of improperly establishing status as a small entity. The intent of the reduced fees for small entities is to soften the impact of the fee increases under §41(a) and (b) of Title 35, United States Code, as such sections are amended by the public law resulting from H.R. 6260, upon those who are least able to absorb the increased fees without overall damage to their ability to participate in the patent system through the filing, issuing and maintaining of patents. Accordingly, any attempt to improperly establish status as a small entity will be viewed as a serious matter by the Office and paragraph 1.28(d) indicates that any attempt to fraudulently establish status as a small entity or pay fees as a small entity will be considered as a fraud practiced or attempted on the Office. In addition, improperly and through gross negligence establishing status as a small entity or paying fees as a small entity will be considered as a fraud practiced or attempted on the Office. Normally, the Office will not question a claim to status as a small entity. However, if the Office must resolve such an issue in a question arising

before it, the Office will look to the actual or practical status of the individual or organization claiming status as a small entity rather than the professed or apparent status.

Section 1.451, paragraph (b), is amended to correct a reference to another section of the regulations.

Parts 3 and 4 are removed to eliminate all of the patent and trademark forms from the Code of Federal Regulations. The Patent and Trademark Office has prepared a booklet entitled "Patent and Trademark Forms Booklet" which is available for sale to the public from the Superintendent of Documents and which includes full size copies of substantially all the forms in Parts 3 and 4. No need is seen to retain these forms in the Code of Federal Regulations in view of the difficulty of keeping such forms current by rule change provisions and since the use of the forms is not mandatory.

Discussion Of Significant Differences Between Proposed And Final Rules

A number of changes which have been made to §§1.9, 1.27 and 1.28 as a result of the comments received and further review of the proposed rulemaking are identified below.

Paragraph (c) of §1.9 has been changed from that proposed to simplify the definition by removing the words "including (i) the right to make, use, or sell the invention, and (ii) the right to exclude others from making, using, or selling the invention". No change in substance is intended by removing these words since the phrase "any rights in the invention" obviously is inclusive of all rights regardless of how they are, or would be, transferred. The words "or otherwise" have also been removed to simplify the definition without a change in substance.

Paragraph (d) of §1.9 is not being promulgated by this rule change.

Paragraph (e) of §1.9 is changed from that proposed by adding the words "located in any country" in item (e)(1) to clarify the fact that a university or other institution of higher education can qualify regardless of location. Paragraph (e) is also changed from that proposed by adding an item (4) to clarify that a nonprofit organization "located in a foreign country" can qualify as a nonprofit organization if it could qualify as a nonprofit organization under item (2) or (3) of paragraph (e) "if it were located in this country." Thus, under paragraph (e) of §1.9 nonprofit organizations will be treated the same for purposes of paying fees regardless of location.

Paragraph (a) of §1.27 has been changed from that proposed by substituting the words "the first fee paid as a small entity" for the words "any fee paid as a small entity". This change is intended to clarify the fact that a verified statement is not required with every fee.

Paragraph (b) of §1.27 has been changed from that proposed to clarify who is to file the verified statement. The verified statement for a small business concern or nonprofit organization is to be filed by "the owner of the small business concern, or an official of the small business concern or nonprofit organization empowered to act on behalf of the small business concern or nonprofit organization..." The term "official" as used in paragraph (b) is intended to include any officer, employee, or part-owner empowered to act on behalf of a small business concern or nonprofit organization. For example, an officer or employee of a corporation empowered to act for the corporation by its board of directors would be qualified to sign such a verified statement.

Paragraph (c) of §1.27 relating to claiming status as a small business concern is not being promulgated at this time, but will be the subject of a separate final rule.

Paragraph (d) of §1.27 has been changed from that proposed in the same manner as paragraph (b) of §1.27 to clarify who is to file the verified statement. Paragraph (d) of §1.27 has also been changed from that proposed by adding a reference to §1.9(e)(4).

Paragraph (a) of §1.28 has been changed from that proposed by adding the words "or patent" in the first and third sentences since the failure to establish status as a small entity could occur in a patent as well as in an application. An exception to the requirement for a verified statement has also been inserted into paragraph (a) of §1.28 for applications filed under §1.60 where the status as a small entity has been established in a parent application and is still proper. Under this change in paragraph (a) of proposed §1.28, the application filed under §1.60 "must include a reference to a verified statement in a parent application if status as a small entity is still proper and desired."

Paragraph (b) of §1.28 has been completely rewritten from that proposed to remove the requirement that the notification of a change in status resulting in loss of entitlement to small entity status must be filed prior to paying the next fee due. Instead, paragraph (b) of §1.28 provides that after establishment of small entity status, "fees as a small entity may thereafter be paid in that application or patent without regard to a change in status until the issue fee is due or any maintenance fee is due." Paragraph (b) of §1.28 is also changed from that proposed by removing the sentence stating that payment of any fee as a small entity serves "as a representation that such payment as a small entity is proper at the time the payment is made." This change does not sanction the payment of improper fees, but is no longer necessary in view of another change in paragraph (b) which specifically provides that notification of any change in status resulting in loss of entitlement to small entity status "must be filed in the application or patent prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate pursuant to §1.9." The effect of the changes to paragraph (b) of §1.28 is to permit status to be established and then checked only (1) at the payment of the issue fee and (2)

at the time of payment of each maintenance fee. This means that only four checks are required during the pendency and term of a patent after initial establishment of small entity status if such establishment was made prior to payment of the issue fee. The last sentence of paragraph (b) has been changed from that proposed by inserting the words "of change in status" after "notification" for clarity.

Paragraph (c) of §1.28 has been changed from that proposed to require a verified statement explaining how the error in good faith occurred only in situations where the error is not corrected within three months of the date on which the error occurred. This change from paragraph (c) as proposed will reduce paperwork and will provide a three-month grace period to correct errors with no explanations required for correction during that three-month period. The change has also been made to alleviate concerns about paragraph (d) of §1.28 which is being adopted as proposed.

Response to Comments on the Patent Rules

Specific comments were received on a number of the sections. All of the comments, including the oral testimony and the written comments, were considered in adopting the changes set forth herein.

Written comments on the patent rules and forms affected by this final rule were received from three patent law groups and thirteen individuals. The three patent law groups were (1) the American Patent Law Association; (2) the Patent, Trademark, and Copyright Section of the Virginia State Bar; and (3) the Patent, Trademark and Copyright Law Section of the Bar Association of the District of Columbia.

Oral comments were presented at the hearing on behalf of two patent law groups.

The comments appear below along with replies thereto.

Comment:

One comment suggested that the definition of "independent inventor" be simplified.

Reply:

The definition of "independent inventor" has been simplified without a change in substance by removing the words "including (i) the right to make, use, or sell the invention, and (ii) the right to exclude others from making, using, or selling the invention."

Comment:

One comment suggested that there is no need to include any more than a simplified statement that a "non-profit organization includes a university or other institution of higher education"

and that any other party that believes it qualifies will "be able to make a showing to qualify for non-profit organization status."

Reply:

The suggestion has not been adopted since it is the intent of the rules to delineate as clearly as possible what organizations can qualify as nonprofit organizations without having to expend undue resources deciding each request on a case-by-case basis.

Comment:

One comment suggested that §1.9(e) discriminates against foreigners and thus violates the principle of national equality set forth in the Stockholm text of the Paris Convention for the Protection of Industrial Property.

Reply:

Section 1.9(e), as promulgated, defines a nonprofit organization in such a way that it is clear that foreigners are not excluded.

Comment:

One comment questioned whether or not government organizations can qualify as nonprofit organizations and more specifically, whether or not a government research facility can qualify under the broad definition of a nonprofit scientific or educational organization. Another comment recommended that §1.9(e) be expanded to include the U.S. Government in the definition of a "nonprofit organization."

Reply:

Government organizations as such, whether domestic or foreign, cannot qualify as nonprofit organizations as defined in §1.9(e). Section 1.9(e) was based upon 35 U.S.C. 201(i), as established by Public Law 96-517. The limitation to "an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c)(3)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a))" would by its nature exclude the U.S. government and its agencies and facilities, including research facilities and government corporations. State and foreign governments and governmental agencies and facilities would be similarly excluded. Section 1.9(e) is not intended to include within the definition of a nonprofit organization government organizations of any kind located in any country. A university or other institution of higher education located in any country would qualify, however, as a "nonprofit organization" under §1.9(e) even though it has some government affiliation since such institutions are specifically included.

Comment:

One comment was directed to, and opposed, Public Law 96-517 and H.R. 6260 rather than the specific provisions of §§1.9, 1.27 and

1.28 on the ground that the concept of a self-supporting agency is ill-conceived, shortsighted and wrong.

Reply:

Public Law 96-517 and H.R. 6260 are not issues for consideration in this rule change.

Comment:

One comment asserted that the imposition of different fees depending upon the status of an applicant is unwise, unworkable, and will not "improve the efficiency of the Patent Office", while another comment urged the Office to "disavow the proposal for a two-tier fee system and adopt a different approach to assuring that patent and trademark fees are set so that individual inventors and small businesses can continue to obtain the protection of the patent and trademark system." Another comment supported the two-tier fee system, particularly as related to universities.

Reply:

The imposition of different fees is a legislative mandate imposed by the public law resulting from H.R. 6260 and is not an issue for consideration in this rule change.

Comment:

Four comments expressed concern that small entity status is required to be confirmed each time a fee as a small entity is paid. Alternative procedures which involve (1) confirming status at the time of filing and at the time the issue fee is paid, or (2) allowing a statement of status to hold for a period of time were recommended.

Reply:

The last sentence in §1.27(a) states that "[s]uch a verified statement need only be filed once in an application or patent and remains in effect until changed." It was not intended that such statements would be required each time a fee is paid. In order to clarify §1.27(a), the first sentence has been changed to require the statement prior to or with the first fee paid as a small entity. Thereafter, notice is only required where a change in status occurs. In addition, §1.28(b) has been rewritten to provide that "[o]nce status as a small entity has been established in an application or patent, fees as a small entity may thereafter be paid in that application or patent without regard to a change in status until the issue fee is due or any maintenance fee is due."

Comment:

One comment suggested that a paragraph 1.27(e) be added which would require confirmation of small entity status at the time of paying the patent issue fee and each maintenance fee and that this be done by a statement which designates the applicant's

small entity status as of the close of the last fiscal year next preceding the date of the statement.

Reply:

The suggested paragraph has not been added. However, paragraph (b) of §1.28 has been completely rewritten to permit status to be established and then checked only (1) at the payment of the issue fee and (2) at the time of payment of each maintenance fee. Instead of requiring papers to be filed confirming status as suggested in the comment, the rules as adopted require that "[n]otification of any change in status resulting in loss of entitlement to small entity status must be filed in the application or patent prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate pursuant to §1.9." Paragraph (b) of §1.28, as promulgated, is considered preferable to the suggested paragraph (e) of §1.27 since it will eliminate the filing of a confirming statement where there has been no change in status as a small entity. This reduces unnecessary paperwork.

Comment:

One comment suggested that verified statements of small entity status need not be filed in Rule 60 applications.

Reply:

The suggestion was adopted and is reflected by the change in §1.28(a). In such applications, it will be sufficient to include a reference to a verified statement establishing small entity status in a parent application if status as a small entity is still proper and desired.

Comment:

One comment suggested that proposed paragraph 1.28(b) be amended by inserting the words "believed to be" after "small entity is" in the second sentence.

Reply:

Paragraph (b) of §1.28 as promulgated does not contain the sentence to which the suggestion is directed.

Comment:

One comment suggested that paragraph (c) of §1.28 be amended by deleting the word "verified" so that a statement explaining how an error in good faith occurred can be made "on the basis of information and belief."

Reply:

The suggestion has not been adopted. However, paragraph (c) of §1.28 as promulgated permits the correction of errors without a

verified statement if the correction is accomplished within three months after the date the error occurred.

Comment:

Three comments expressed concern about the provision dealing with fraud on the Patent and Trademark Office because of some questionable act in connection with paying fees as a small entity and indicated that some persons have raised a question as to the Office's authority to designate the payment of a lesser fee as fraud. The comments suggested that proposed §1.28 be withdrawn and turned over to an ad hoc group of Patent and Trademark Office officials and practitioners for immediate examination and timely comment.

Reply:

The period for comments was extended until August 13, 1982, as an alternative to, and in response to, the suggestion that §1.28 be withdrawn and turned over to an ad hoc committee. The extended period for comments has now expired and all comments which have been received have been carefully considered. In response to the statement that some persons have raised a question regarding the Office's authority to designate payment of a lesser fee as fraud, no authority has been cited which would establish or suggest that the Office does not have the authority to adopt this section. Paragraph (d) of §1.28 has been strictly limited to those situations in which there is an attempt to fraudulently establish status as a small entity, fraudulently pay fees as a small entity, or improperly and through gross negligence establish status or pay fees as a small entity. Paragraph (d) of §1.28 is clearly within the rule-making authority provided to the Commissioner pursuant to 35 U.S.C. 6 to protect the integrity of the system established by the public law resulting from H.R. 6260, whereby fees are reduced for small entities. In order to alleviate the concerns expressed about paragraph (d) of §1.28, paragraph (c) of §1.28 has been changed from that proposed to require a verified statement explaining how the error in good faith occurred only in situations where the error is not corrected within three months of the date on which the error occurred. This three-month grace period to correct errors with no explanations required for correction during that three-month period should reduce the concern about paragraph (d) of §1.28.

Comment:

One comment by an attorney (1) objected to and requested removal of the second sentence of §1.28(d) because he has to rely on the information provided by the client and does not have the facilities to check the reliability of information the client provides relating to the client's status as a small entity, and (2) raised the question as to how much investigation any attorney or other individual must make in order to avoid being guilty of "gross negligence" under §1.28(d).

Reply:

The rules do not authorize an attorney to sign a verified statement establishing status as a small entity on behalf of a client. The client has to sign the verified statement. Paragraph (b) of §1.27 requires that any verified statement filed on behalf of an independent inventor must be signed by the independent inventor except as provided in §§1.42, 1.43, or 1.47. Paragraph (d) of §1.27 requires that any verified statement filed on behalf of a nonprofit organization must be signed by an official of the nonprofit organization empowered to act on behalf of the organization. The intent of paragraphs (b) and (d) of §1.27 is that the verified statement be signed by the person in the best position to know the facts as to whether or not status as a small entity can be properly established. Insofar as the attorney's responsibilities and duty to investigate are concerned, these do not differ from those presently owed the Office under §§1.56, 1.346, and 1.555.

Comment:

One comment suggested that paragraph (d) of §1.28 be replaced by a provision under which a "stiff fine" would be assessed against "a wrongdoer who has not paid fees in good faith."

Reply:

The suggestion has not been adopted. Assessing a fine as the only penalty against "a wrongdoer who has not paid fees in good faith" might tend to encourage the payment of incorrect fees on the theory that it is unlikely that such a matter would be brought to the attention of the Office.

Comment:

Three comments opposed the proposed deletion of Part 3 for the reasons that (1) it is useful to have an up-to-date set of forms and (2) there does not seem to be a pressing need to delete the forms.

Reply:

The Patent and Trademark Office has prepared a booklet entitled "Patent and Trademark Forms Booklet" which includes full size copies of substantially all of the forms in Part 3. Since the forms currently in Part 3 are not "up-to-date" as was suggested in the comment, no present need is seen to maintain Part 3.

Response to Comments on the Trademark Rules

Specific comments were received on the proposed deletion of Part 4. All of the comments included in the written submissions and the oral testimony were considered.

Written comments were received from four individuals. Oral comments restating previously submitted written comments on Part 4 were presented by one individual on behalf of his law firm.

These comments appear below along with replies thereto.

Comment:

One comment stated that there are rules in Part 4 which are not set forth elsewhere. Such guidelines and information include, among others, the types of commerce on which an application may be based and a requirement for the use of bond paper for typed drawings.

Reply:

Part 4 does not really carry the effect of rules because the forms are not mandatory, but are merely illustrative. The information referred to by this individual can be found elsewhere, such as in the Trademark Manual of Examining Procedure. Furthermore, despite the fact that the forms do not carry the force of rules, any correction or modification to them requires the cumbersome and time-consuming processes that are associated with a rules change.

Comment:

Several comments reflected the opinion that some attorneys, particularly those who do not specialize in trademark matters, may rely on the forms that appear in Part 4. It was believed that these individuals may not have or be aware of the compilation of forms identified as the "Patent and Trademark Office Forms Booklet." In the absence of such forms in Part 4, these individuals may devise their own application formats. Such a practice would result in increased informalities which, in turn, would result in unnecessary correspondence and delayed prosecution. In addition, the commenters believed that the number of written and oral inquiries to the Office of the Director of the Trademark Examining Operation would increase dramatically.

Reply:

The Office of the Director of the Trademark Examining Operation currently has a general information telephone line to answer inquiries and to accept requests for trademark application forms and related literature. While the Office of the Director indicates the availability of the forms booklet to many callers, copies of the appropriate trademark application form are sent to those individuals who request them. It is more likely that an individual who is unaware of the trademark application format would call the Office of the Director to request an application form than create one for the particular purpose.

Comment:

One individual, aware of the Office's plans for automation of the trademark program, saw the present deletion of the forms to be inappropriate. This individual felt that the deletion of the forms at this point would signal to the user community that the Office no longer had any interest in receiving applications in any particular format. To take such a position within a year or two of the introduction of a rigidly standardized application format was, in the opinion of this commenter, unwise. The

adoption of a machine-readable application form would require greater, rather than diminished, reliance on a prescribed format.

Reply:

Within the next year or two, the Office will begin experimenting with the use of optical character recognition (OCR) equipment to automate the current data capture processes. Trademark application formats that are compatible with this equipment are likely to require special sizing and printing and, as such, are not acceptable for reduced size printing in the Code of Federal Regulations. If the existing forms were to be maintained in Part 4, they would remain available for use by applicants. As a result, the implementation of the new standardized application formats would be made more difficult.

Comment:

One commenter believed that since the next reprinting of Volume 37 of the Code of Federal Regulations will be in July, 1983, there is no pressing need to eliminate Part 4 at this time. This individual felt that users of the trademark registration system should be given additional opportunity to consider the significance of removing Part 4.

Reply:

Only four comments have been received on the deletion of Part 4. The elimination of Part 4 at this time will guarantee that the forms do not appear in the 1983 reprinting of the CFR. Of course, they will appear in the 1982 version of the CFR booklet and will be available until the new edition is published. In this matter, future access to these forms will be limited and those requiring help may contact the Office and receive the proper trademark forms.

Implementation of §§1.9, 1.27, and 1.28

Status as a small entity can be established in any application or patent for which a fee is due on or after October 1, 1982, and in which small entity status is available and desired.

OTHER CONSIDERATIONS RELATING TO PATENT AND TRADEMARK FEE REVISIONS

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

This rule change is in conformity with the requirements of the Regulatory Flexibility Act (Public Law 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et. seq.).

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96-354) for several reasons. The public law resulting from H.R. 6260 has taken into consideration the

impact the increase in fees may have on small entities. Under the public law resulting from H.R. 6260 and this rulemaking, small entities will be able to pay reduced fees for filing patent applications and for the issuance and maintenance in force of patents. In general, the rule change will also expedite proceedings before the Patent and Trademark Office, changing existing procedures where they can be simplified.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et. seq., since no significant additional record keeping or reporting requirements are placed upon the public.

List of Subjects in 37 CFR Parts 1, 3 and 4

Administrative practice and procedure, Colleges and universities, Courts, Fraud, Inventions and patents, Nonprofit organizations, Small businesses, Trademarks.

AMENDMENT OF REGULATIONS

For the reasons indicated above and pursuant to the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the public law resulting from H.R. 6260, and under Sections 31 and 41 of the Trademark Act of July 5, 1946, (15 U.S.C. §§1113, and 1123), Parts 1, 3 and 4 of Title 37, Code of Federal Regulations, are amended as set forth below.

PART 1 - RULES OF PRACTICE IN PATENT CASES

The table of contents for Part 1 is amended as follows:

FEES AND PAYMENT OF MONEY

* * * * *

1.27 Statement of status as small entity;

1.28 Effect on fees of failure to establish status, or change status, as a small entity.

1. Section 1.9 is amended by adding new paragraphs (c), (e) and (f) and adding and reserving paragraph (d) to read as follows:

§1.9 Definitions.

* * * * *

(c) An independent inventor as used in this chapter means any inventor who (1) has not assigned, granted, conveyed, or licensed, and (2) is under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who could not likewise be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section.

(d) [Reserved]

(e) A nonprofit organization as used in this chapter means (1) a university or other institution of higher education located in any country; (2) an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c)(3)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a)); (3) any nonprofit scientific or educational organization qualified under a nonprofit organization statute of a state of this country (35 U.S.C. 201(i)); or (4) any nonprofit organization located in a foreign country which would qualify as a nonprofit organization under paragraphs (e)(2) or (3) of this section if it were located in this country.

(f) A small entity as used in this chapter means an independent inventor, a small business concern or a nonprofit organization.

2. Section 1.27 is added to read as follows:

§1.27 Statement of status as small entity.

(a) Any person seeking to establish status as a small entity (§1.9(f) of this Part) for purposes of paying fees in an application or a patent must file a verified statement in the application or patent prior to or with the first fee paid as a small entity. Such a verified statement need only be filed once in an application or patent and remains in effect until changed.

(b) Any verified statement filed pursuant to paragraph (a) of this section on behalf of an independent inventor must be signed by the independent inventor except as provided in §§1.42, 1.43, or 1.47 of this Part, and must aver that the inventor qualifies as an independent inventor in accordance with §1.9(c) of this Part. Where there are joint inventors in an application, each inventor must file a verified statement establishing status as an independent inventor in order to qualify as a small entity. Where any rights have been assigned, granted, conveyed, or licensed, or there is an obligation to assign, grant, convey, or license, any rights to a small business concern, a nonprofit organization, or any other individual, a verified statement must be filed by the individual, the owner of the small business concern, or an official of the small business concern or nonprofit organization empowered to act on behalf of the small business concern or nonprofit organization averring to their status.

(c) [Reserved]

(d) Any verified statement filed pursuant to paragraph (a) of this section on behalf of a nonprofit organization must (1) be signed by an official of the nonprofit organization empowered to act on behalf of the organization; (2) aver that the organization qualifies as a nonprofit organization as defined in §1.9(e) of this Part specifying under which one of §1.9(e)(1), (e)(2), (e)(3), or (e)(4) of this Part the organization qualifies; and (3) aver that exclusive rights to the invention have been conveyed to and remain with the organization or if the rights are not exclusive, that all other rights belong to small entities as defined in §1.9 of this Part. Where the rights of the nonprofit organization as a small entity are not exclusive, a verified statement must also be filed by the other small entities having rights averring to their status as such.

3. Section 1.28 is added to read as follows:

§1.28 Effect on fees of failure to establish status, or change status, as a small entity.

(a) The failure to establish status as a small entity (§§1.9(f) and 1.27 of this Part) in any application or patent prior to paying, or at the time of paying, any fee (1) precludes payment of the fee in the amount established for small entities; and (2) precludes a refund pursuant to §1.26 of this Part of any portions of fees paid prior to establishing status as a small entity. Status as a small entity is waived for any fee by the failure to establish the status prior to paying, or at the time of paying, the fee. Status as a small entity must be specifically established by a verified statement filed in each application or patent in which the status is available and desired, except those applications filed under §1.60 of this Part where the status as a small entity has been established in a parent application and is still proper. Once status as a small entity has been established in an application or patent, the status remains in that application or patent without the filing of a further verified statement pursuant to §1.27 of this Part unless the Office is notified of a change in status. Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established, except those filed under §1.60 of this Part. Applications filed under §1.60 of this Part must include a reference to a verified statement in a parent application if status as a small entity is still proper and desired.

(b) Once status as a small entity has been established in an application or patent, fees as a small entity may thereafter be paid in that application or patent without regard to a change in status until the issue fee is due or any maintenance fee is due. Notification of any change in status resulting in loss of entitlement to small entity status must be filed in the application or patent prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer

appropriate pursuant to §1.9 of this Part. The notification of change in status may be signed by the applicant, any person authorized to sign on behalf of the assignee, or an attorney or agent of record or acting in a representative capacity pursuant to §1.34(a) of this Part.

(c) If status as a small entity is established in good faith, and fees as a small entity are paid in good faith, in any application or patent, and it is later discovered that such status as a small entity was established in error or that through error the Office was not notified of a change in status as required by paragraph (b) of this section, the error will be excused (1) if any deficiency between the amount paid and the amount due is paid within three months after the date the error occurred or (2) if any deficiency between the amount paid and the amount due is paid more than three months after the date the error occurred and the payment is accompanied by a verified statement explaining how the error in good faith occurred and how and when it was discovered.

(d)(1) Any attempt to fraudulently (i) establish status as a small entity or (ii) pay fees as a small entity shall be considered as a fraud practiced or attempted on the Office. (2) Improperly and through gross negligence (i) establishing status as a small entity or (ii) paying fees as a small entity shall be considered as a fraud practiced or attempted on the Office. See §§1.56(d) and 1.555 of this Part.

§1.451 [Amended]

4. In section 1.451, paragraph (b) is amended by removing the reference "§1.19(a)(4)" and inserting in its place the reference "§1.19(a)(3)".

PART 3 - FORMS FOR PATENT CASES

5. Part 3 is removed.

PART 4 - FORMS FOR TRADEMARK CASES

6. Part 4 is removed.

8/26/82
Date

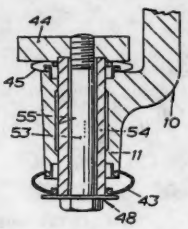
Gerald J. Mossinghoff
Commissioner of Patents & Trademarks

REEXAMINATIONS

SEPTEMBER 21, 1982

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination

B1 Re. 29,582 (17th)
DISC BRAKES AND MOUNTING STRUCTURE THEREFORE
Peter William Brown, Solihull, England, assignor to Girling Limited, Warwickshire, England.
Continuation of Ser. No. 454,613, Mar. 25, 1974, abandoned.
Reexamination Request No. 90/000,026, Jul. 10, 1981.
Reexamination certificate for Patent No. Re. 29,582, issued Mar. 21, 1978, Ser. No. 615,984, Sep. 23, 1975.
U.S. Cl. 188/73.45 **Int Cl.[3] F16D 65/14**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–13 and 19 is confirmed.

Claims 14–16, 18 and 20 are determined to be patentable as amended:

14. A sliding caliper disc brake comprising a rotatable disc, a torque plate member for fixing to a vehicle frame or like portion, a caliper member straddling a minor portion of the periphery of the disc for moving friction pad means disposed on opposite sides of the disc into braking engagement with the disc, motor means in the caliper member for directly urging one pad means onto one side of the disc to cause the caliper member to slide relative to the torque plate member to apply by reaction the opposite pad means to the other side of the disc, and a connection between [the caliper member and the torque plate member] *one and the other of said members* comprising a pin element [which has a] *having an axis substantially parallel to the axis of the disc rotation and an axially extending* sliding surface in *close* sliding engagement with a wall of *a* [an] *complementary* opening in [one] *the other* of said members, *and an axially extending bore passing through said pin element from end to end thereof, means for releasably connecting said pin element at one end to said one member comprising a component extending axially through said bore in said pin element and having an abutment surface at one end and means at its opposite end releasably engaging said one member to axially clamp said pin element between said one member and said abutment surface, with there being no further connection between said component and said one member whereby said pin element when clamped by said component to said one member extends freely axially away from said one member, there being no further sliding surface separate from that on said pin element in said connection between said members,* and sealing means extending between said pin elements and said [one] *other* of said members and at all times enclosing all of said sliding surface, said sealing means having one end sealed to said [one] *other* of said members, and having its other end sealed to said pin element so as to protect all of the sliding surface of *said pin element and to retain said pin element in said opening* even when said caliper member is separated from said torque plate member.

15. The disc brake according to claim 14 wherein said sealing means comprises flexible boot means in sealing engagement with said [one] *other* member at opposite ends of [said] *the* opening *therein,* and in sealing engagement with said pin element adjacent the ends of said opening.

16. A sliding caliper disc brake comprising a rotatable disc, a torque plate member for fixing to a vehicle frame or like portion, a caliper member straddling a minor portion of the periphery of the disc for moving friction pad means disposed on opposite sides of the disc into braking engagement with the disc, motor means in the caliper means for directly urging one pad means onto one side of the disc to cause the caliper member to slide relative to the torque plate member to apply by reaction the opposite pad means to the other side of the disc, and a connection between the caliper member and the torque plate comprising a two-part pin, one part of said pin having [a] *one end abutting one of said members and extending away from said one member in a direction substantially parallel to the axis of disc rotation, said one part having an axially extending* sliding surface slidable in an opening in [one] *the other* of said members [and] the other part of said pin [fixing said first part with respect to the other of said members] *having an abutment surface at one end for engaging the corresponding end of said one pin part end means at the other end for releasably engaging said one member to axially clamp said one pin part between said abutment surface and said one member with there being no further connection between said second pin part and said one member whereby said pin extends freely axially away from said one member, there being no further sliding surface separate from that on said one pin part in said connection between said members,* and sealing means extending between said one part of said pin and said [one] *other* of said members and at all times enclosing all of said sliding surfaces, said sealing means having one end sealed to said [one] of said members, and having [its] *the* other end sealed to said one pin part so as to protect all of the sliding surface of said one pin part *and to retain said one pin part in said opening in the other of said members* even when said caliper member is separated from said torque plate members.

18. A sliding caliper disc brake comprising a rotatable disc, a torque plate member for fixing to a vehicle frame or like portion, a caliper member straddling a minor portion of the periphery of the disc for moving friction pad means disposed on opposite sides of the disc into braking engagement with the disc, motor means in the caliper member for directly urging one pad means onto one side of the disc to cause the caliper member to slide relative to the torque plate member to apply by reaction the opposite pad means to the other side of the disc, and a connection between the caliper member and the torque plate *member* comprising a first component having *an axis substantially parallel to the axis of disc rotation and* a sliding surface slidably received in an opening in one of said members, a second component abutting *one end of*

said first component and *being* in releasable engagement with the other of said members to *axially* clamp *the other end of* said first component against the other of said members, *said second component engaging said other member only at the clamped end of said first component, there being no further sliding surface separate from that on said first component in said connection between said members,* and sealing means extending between said first component and said one of said members and having releasable engagement with both [so as to retain said first component in said opening], said sealing means having one end sealed to said one of said members and having [its] *the* other end sealed to said first component so as to protect all of the sliding surface of said first component *and retain said first component in said opening* even when said caliper member is separated from said torque plate member.

20. A sliding caliper disc brake comprising a rotatable disc, a torque plate member for fixing to a vehicle frame or like portion, a caliper member straddling a minor portion of the periphery of the disc for moving friction pad means disposed on opposite sides of the disc into braking engagement with the disc, motor means in the caliper member for directly urging one pad means onto one side of the disc to cause the caliper member to slide relative to the torque plate member to apply by reaction the opposite pad means to the other side of the disc, and a connection between the caliper member and the torque plate member comprising a pin [element which has] *having an axis substantially parrallel to the axis of disc rotation and* a sliding surface in sliding engagement whith a wall of [an] *a complementary* opening in one of said members and which is releasably fixed *at one end only* to the other of said members, and sealing means extending between said pin [element] and said one of said members while having no connection with the other of said members, *there being no further sliding surface separate from that on said pin in said connection between said members,* said sealing means at all times enclosing all of said sliding surface, said sealing means having one end sealed to said one of said members, and having [its] *the* other end sealed to said pin [element] so as to protect all of the sliding surface of said pin [element] *and to retain said pin within said opening* even when said caliper member is separated from said torque plate member.

Claim 17, having been finally determined to be unpatentable, is cancelled.

New claims 21 and 22 are added and determined to be patentable.

21. *The sliding caliper disc brake of claim 14 wherein said one member is the torque plate member and the other member is the caliper member.*

22. *The sliding caliper disc brake of claim 14 wherein said complementary opening in the other of said members is peripherily closed to provide the close sliding fit with said pin element.*

B1 4,148,414 (18th)
ROW CROP PLANTER

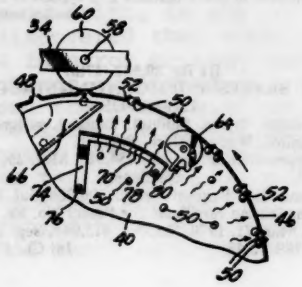
Earl R. Parks, Jr., 0141 W Rd. 700S, LaPorte, Ind. 46350

Reexamination Request No. 90/000,033, Jul. 23, 1981.
Reexamination Certificate for Patent No. 4,148,414, issued Apr. 10, 1979, Ser. No. 856,264, Dec. 1, 1977.
U.S. Cl. 221/278. Int. Cl.³ B65H 3/08

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-3 is confirmed.

1. In a row crop planter comprising a rotatable seed-drum having a plurality of circumferential peripheral series of apertures surrounded by seed-receiving projections, means of delivering seed into said drum, means for discharging air under pressure into said drum to position and retain seeds at and adjacent each aperture as the drum rotates, roller means positioned exteriorly of and above said drum and engageable with said projections, collecting and distributing means position within said drum below said roller means, and a brush within the upper part of said drum in counter-rotational spaced relation to said roller means for engaging and releasing into the lower position of said drum seeds, in excess of a



single seed positioned at and adjacent each projection, the improvement comprising an air permeable seed barrier positioned in said drum between said collecting and distributing means and said brush to prevent reattachment of seeds at the portion of the drum between the brush and the distributing means.

B1 4,117,195 (19th)
MANUFACTURE OF EXTRUDED PRODUCTS

Peter Swarbrick, Upton-by-Chester, William John Green, Pinner, both of England, and Charles Maillefer, Lausanne, Switzerland, assignors to BICC Limited, London, England, and Etablissements Maillefer SA, Lausanne, Switzerland.

Reexamination Request No. 90/000,009, Jul. 1, 1981.
Reexamination Certificate for Patent No. 4,117,195, issued Sep. 26, 1978, Ser. No. 638,448, Dec. 8, 1975
Claims priority, application United Kingdom, Dec. 6, 1974, 52917/74
U.S. Cl. 428/379 Int. Cl.³ C08F 255/02

AS A RESULT OF REEXAMINATION IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-17 is confirmed.

1. A method of making a cross-linked extruded product comprising:

metering into a screw extrusion machine having a barrel and a screw extending from end to end thereof a polymer capable of being cross-linked by the use of a hydrolysable unsaturated silane together with proportionate amounts of compounding ingredients comprising a hydrlysable unsaturated silane, a free-radical generator and a silanol condensation catalyst, at least one of said compounding ingredients being metered separately from sand polymer;

blending said compounding ingredients with said polymer in a first zone of said barrel of said extruder to form a mixture and when blending is complete heating said mixture in a second zone of said barrel downstream of said first zone until silane groups have been grafted to said polymer, the amount of said free-radical generator being sufficiently low to limit direct free radical cross linking to a level that will not prevent extrusion of the material.

extruding said mixture directly out of said extruder through an extrusion die to form an elongate product of a required final shape,

and subjecting said elongate product to the action of moisture until said polymer therein is cross-linked.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4559
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF July 24, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-18-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-09-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-18-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-13-81
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-09-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	8-20-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	9-18-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-20-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	4-09-80
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	7-07-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-14-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-27-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-13-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	5-24-82
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	11-27-79

Expiration of patents: The patents within the range of numbers indicated below expire during July 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... **Numbers 3,192,536 to 3,197,783, inclusive**

Plant Patents ..... **Numbers 2,543 to 2,545 inclusive**

REISSUES

SEPTEMBER 21, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,032

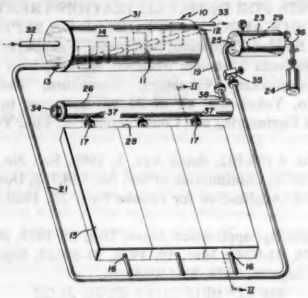
SOLAR WATER HEATER

Roger F. French, Jackson, N.H., assignor to Suntime, Inc., Bridgton, Me.

Original No. 4,240,405, dated Dec. 23, 1980, Ser. No. 34,475, Apr. 30, 1979. Application for reissue May 4, 1981, Ser. No. 260,318

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—433 6 Claims



1. Solar water heater making use of phase-change heat transfer, comprising:

(a) a condenser having an *upper* inlet and [an] *a lower* outlet, which condenser is in contact with the water to be heated,

(b) a solar collector having a bottom inlet and a top outlet and [having an] *at least one* inner conduit that connects the inlet and the outlet, the conduit being suitable for exposing a heat-transfer medium [in] *within the length of* the conduit to solar energy, the collector outlet being located below the condenser,

(c) [conduits joining] *a second conduit connecting* the outlet of the collector *directly* to the inlet of the condenser and *a third conduit connecting* the outlet of the condenser directly to the inlet of the collector to form a closed circuit, [(d) A] *said closed circuit adapted to be charged with a* phase-change [liquid] heat transfer medium [located within the circuit],

(d) means for limiting the pressure in said closed circuit during normal operation of the heater, and

[(e) an accumulator having means for regulating the pressure therein and having an inlet that is connected to the circuit below the collector, and]

[F] *(e)* a vapor-release drum connected in the circuit [between the outlet of the solar collector and the inlet of the condenser], *upstream of said condenser and downstream of said inner conduit, said inner conduit having its outlet at a point in said drum which is during normal operation of the heater below the liquid-vapor interface within said drum so as to receive heat transfer medium from said inner conduit and,* wherein the vapor-release drum has sufficient volume that the upper surface of the heat transfer medium [always] remains within the confines of the drum so that, during normal operation of the heater only the heat transfer medium which becomes vaporized is released into the inlet of the condenser *whereby all heat transfer takes place due to the conversion of the vapor to the liquid phase.*

Re. 31,033

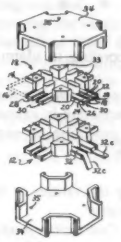
ELECTRICAL POWER DISTRIBUTION ASSEMBLY

Lester E. Wilson, Jr., Short St., Bedford, Mass. 01730, and Stephen A. Machcinski, 228 Cottage Park Rd., Winthrop, Mass. 02152

Original No. 4,148,546, dated Apr. 10, 1979, Ser. No. 893,398, Apr. 4, 1978. Application for reissue Apr. 7, 1981, Ser. No. 251,929

Int. Cl.³ H01R *13/10*

U.S. Cl. 339—192 R 4 Claims



1. An electrical power distribution assembly comprising:

(1) a electrically insulating, electrical contact deck means having:

(a) first and second, spaced generally planar surfaces;

(b) means defining a peripheral edge between said surfaces;

(c) means defining at least two electrical contact channels in the first surface and at least two congruent electrical contact channels in the second surface, said contact channels each extending from one location on the peripheral edge to at least one other location on the peripheral edge;

(2) a first electrical contact positioned within one of said contact channels in the first surface and extending between said one peripheral edge location and the other location, said electrical contact having a portion thereof extending around the peripheral edge of the [first] *electrical contact* deck means at each location and into the congruent channel in the second surface along a portion thereof; and,

(3) a second electrical contact positioned within the second surface channel that is congruent to the other of said first surface contact channels, said second electrical contact extending between said one peripheral edge location and the other location and having a portion thereof extending around the peripheral edge of the deck means at each location and into said other first surface channel along only a portion thereof.

Re. 31,034

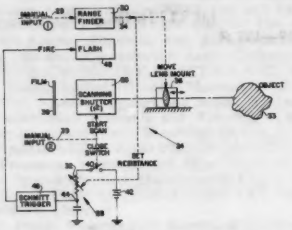
RANGE SYNCHRONIZED FLASH PHOTOGRAPHIC APPARATUS AND METHOD FOR ACHIEVING OPTIMUM FLASH EXPOSURE

Conrad H. Biber, Needham; Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Original No. 4,188,103, dated Feb. 12, 1980, Ser. No. 898,546, Apr. 21, 1978. Application for reissue Jun. 1, 1981, Ser. No. 268,781

Int. Cl.³ G03B *7/10, 15/05*

U.S. Cl. 354—27 **20 Claims**



2. Apparatus [according to claim 1] *for photographing a subject, comprising:*

a scanning shutter which when actuated produces a predetermined, timewise variation in exposure aperture area;

ranging means for providing an output representative of the range of a subject;

a flash unit; and

means for actuating the shutter to start its scanning, the improvement comprising:

means for firing the flash unit to produce a flash of illumination after a time period, measured from the first light through the shutter, dependent on the output of the ranging means, the relationship between the time period and subject range establishing a parametric relationship between the brightness of the subject due to its flash illumination and the scanning time of the shutter, the inverse of this parametric relationship constituting the timewise variation in the exposure aperture area of the shutter; and

wherein said relationship between said time [interval] *period* and range is linear, and the exposure aperture area varies as the square of the timing during scanning.

Re. 31,035

ARRANGEMENT FOR PREPARING NATURAL TISSUE FOR IMPLANTATION

Warren D. Hancock, Newport Beach, and Frederick P. Sattler, Fullerton, both of Calif., assignors to Hancock Laboratories, Inc., Anaheim, Calif.

Original No. 4,050,893, dated Sep. 27, 1977, Ser. No. 665,520, Mar. 10, 1976. Continuation of Ser. No. 490,686, Jul. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 324,217, Jan. 16, 1973, abandoned, which is a continuation of Ser. No. 28,630, Apr. 15, 1970, abandoned. Application for reissue Jul. 7, 1978, Ser. No. 922,654

Int. Cl.³ C14C *3/16*

U.S. Cl. 8—94.11 **31 Claims**

1. The method of preparing *a* natural heart valve for implantation *so that said valve will have improved tensile strength, will have and retain a generally regular contour with the cusps thereof closed as in diastole, and will be in substantially its natural configuration, so that said valve will remain competent for a prolonged period upon implantation,* comprising the steps of

excising a heart valve from a donor heart, applying a tanning fluid under pressure in the physiologic range to the downstream end of [a natural] *said* heart valve *so excised* so as to cause said valve to assume *a generally regular contour with the cusps thereof coapted and closed as in diastole so that said valve is in* substantially its natural configuration,

and simultaneously applying a tanning fluid to the upstream end of said valve *and to substantially the entire exterior surface of said valve* at a pressure less than that at said downstream end,

thereby to cause said valve substantially to maintain said configuration during *and after* fixation of the tissue thereof *so that said valve can remain competent for a prolonged period of use upon implantation.*

Re. 31,036

CATALYSTS FOR DEMETALLIZATION TREATMENT OF HYDROCARBONS SUPPORTED ON SEPIOLITE

Masayoshi Inooka, Yokohama; Motoyoshi Wakabayashi, Kawasaki; Masatoshi Matsuda; Masaaki Kasuya, both of Yokohama; Munekazu Nakamura, Kamakura, and Tatsuo Morimoto, Yokohama, all of Japan, assignors to Chiyoda Chemical Engineering and Construction Co., Ltd., Yokohama, Japan

Original No. 4,196,102, dated Apr. 1, 1980, Ser. No. 907,586, May 19, 1978. Continuation of Ser. No. 748,752, Dec. 9, 1976, abandoned. Application for reissue Nov. 25, 1980, Ser. No. 210,322

Claims priority, application Japan, Dec. 16, 1975, 50-149121; Feb. 2, 1976, 51-9247; Mar. 19, 1976, 51-30628; Sep. 3, 1976, 51-104955; Sep. 14, 1976, 51-110417

Int. Cl.³ B01J *21/14, 23/20, 23/28*

U.S. Cl. 252—456 **12 Claims**

1. A hydrodemetallization catalyst comprising an effective amount of a catalyst metal component supported on a sepiolite carrier, the catalyst metal being selected from the group consisting of Mo, W and V.

3. A hydrodemetallization catalyst comprising an effective amount of catalyst metal components supported on a sepiolite carrier, the catalyst metal being

(1) at least one member selected from the group consisting of Co., Ni, Fe, Cu and lanthanides and

(2) at least one member selected from the group consisting of Mo, W and V.

Re. 31,037

CATALYSTS FOR DEMETALLIZATION TREATMENT OF HYDROCARBONS SUPPORTED ON SEPIOLITE

Masayoshi Inooka, Yokohama; Motoyoshi Wakabayashi, Kawasaki, and Masatoshi Matsuda, Yokohama, all of Japan assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Original No. 4,196,102, dated Apr. 1, 1980, Ser. No. 907,586, May 19, 1978. Continuation of Ser. No. 748,752, Dec. 9, 1976, abandoned. Application for reissue Nov. 25, 1980, Ser. No. 210,305

Claims priority, application Japan, Mar. 19, 1976, 51-30628

Int. Cl.³ B01J *21/16*

U.S. Cl. 252—457 **9 Claims**

14. A hydrodemetallization catalyst comprising an effective amount of one or more catalyst metal components supported on sepiolite, the catalyst metal being selected from the group consisting of the metals of the IIb group and the transition metals of the Periodic Table, and wherein said catalyst is prepared according to a process comprising the steps of:

(a) grinding sepiolite to a fine powder, 50% or more by weight of which has a particle size of 100-mesh or finer;

(b) adding water to the ground sepiolite to adjust the water content thereof to about 20 to about 350% by weight;

(c) kneading the resulting mixture;
(d) air-drying or heat-treating the moist kneaded sepiolite at a temperature lower than about 1000° C.; and
(e) supporting one or more of said catalyst metal components on the sepiolite, the sequence of steps being (a), (b), (c), (d), and (e) or (e), (a), (b), (c) and (d).

Re. 31,038

CATALYSTS FOR DEMETALLIZATION TREATMENT OF HYDROCARBONS SUPPORTED ON SEPIOLITE

Masayoshi Inooka, Yokohama, and Motoyoshi Wakabayashi, Kawasaki, both of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Original No. 4,196,102, dated Apr. 1, 1980, Ser. No. 907,586, May 19, 1978. Continuation of Ser. No. 748,752, Dec. 9, 1976, abandoned. Application for reissue Nov. 25, 1980, Ser. No. 210,321

Claims priority, application Japan, Dec. 9, 1975, 50-145902; Feb. 2, 1976, 51-9247; Feb. 9, 1976, 51-13018; Mar. 19, 1976, 51-30628; Sep. 3, 1976, 51-104955; Sep. 14, 1976, 51-110417

Int. Cl.³ B01J *20/12*

U.S. Cl. 252—457 **4 Claims**

13. A sepiolite carrier prepared according to process comprising:
(a) grinding sepiolite to a fine powder, 50% or more by weight of which has a particle size of 100-mesh or finer;
(b) adding water to the sepiolite obtained in (a) to adjust the water content thereof to about 20 to about 350% by weight;
(c) kneading the resulting mixture in (b), and subsequently
(d) air-drying or heat-treating the resulting mixture in (c) at a temperature lower than about 1000° C.

Re. 31,039

CATALYSTS FOR DEMETALLIZATION TREATMENT OF HYDROCARBONS SUPPORTED ON SEPIOLITE

Masayoshi Inooka, Yokohama; Yoshihiro Ohguchi, Ebina, both of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Original No. 4,196,102, dated Apr. 1, 1980, Ser. No. 907,586, May 19, 1978. Continuation of Ser. No. 748,752, Dec. 9, 1976, abandoned. Application for reissue Nov. 25, 1980, Ser. No. 210,306

Claims priority, application Japan, Feb. 2, 1976, 51-9247; Mar. 19, 1976, 51-30628; Jul. 10, 1976, 51-82329; Sep. 3, 1976, 51-104955; Sep. 14, 1976, 51-110417

Int. Cl.³ B01J *21/16*

U.S. Cl. 252—457 **11 Claims**

36. A hydrodemetallization catalyst comprising an effective amount of one or more catalyst metal components supported on sepiolite, the catalyst metal being selected from metals of the IIb group and transition metals of the Periodic Table, and wherein said catalyst is prepared according to a process comprising the steps of:
(a) grinding the sepiolite to a fine powder, 50% or more by weight of which has a particle size of 100-mesh or finer;
(b) adding water to the ground sepiolite to adjust the water content thereof to about 20 to about 350% by weight;
(c) kneading the resulting mixture;
(d) air-drying or heat-treating the moist kneaded sepiolite at a temperature lower than about 1000° C.; and
(e) supporting one or more of said catalyst metal components on the sepiolite by contacting the sepiolite with an aqueous acidic solution containing ions of one or more metals selected from the group consisting of metals of the Ib, IIb, IIIa and iron groups of the periodic Table, the sequence of steps being (a), (b), (c), (d), and (e), (a), (b), (c), and (d).

PLANT PATENTS

GRANTED SEPTEMBER 21, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,888

LILY NAMED FELLOWSHIP

Ted T. Kirsch, Myrtle Point, Oreg., assignor to Sun Valley Bulb Farms, Inc., Myrtle Point, Oreg.

Filed Dec. 12, 1980, Ser. No. 216,067
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Oriental hybrid lily plant, substantially as herein shown and described, characterized by its medium large, outwardly-facing, pinkish white flowers which are borne on strong, stiff, upwardly and outwardly-projecting pedicels; and by its generally white petals which are distinguished by a brilliant coral red midrib band appearing on a soft pink background surrounded by white undulating margins.

4,889

CHRYSANTHEMUM NAMED YELLOW WESTLAND

Jacques C. M. van der Knaap, De Lier, Netherlands, assignor to Pan-American Plant Company, Parrish, Fla.

Filed Oct. 2, 1980, Ser. No. 193,033
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct variety of chrysanthemum plant, substantially as herein shown and described, characterized by its yellow quill-shaped ray florets.

PLANT PATENTS

GRANTED SEPTEMBER 21, 1982

PATENTS

GRANTED SEP. 21, 1982

ERRATA

For CLASS	See PATENT NO.
474–012	4,350,491
525–237	4,350,621
524–831	4,350,622
524–391	4,350,623
549–435	4,350,636
549–304	4,350,637
549–275	4,350,638
549–259	4,350,639
525–327	4,350,804
378–046	4,350,889
378–110	4,350,891
372–046	4,350,960

PATENTS

GRANTED SEP. 21, 1982

	No.
PATENT NO.	
	4,350,470
	4,350,471
	4,350,472
	4,350,473
	4,350,474
	4,350,475
	4,350,476
	4,350,477
	4,350,478
	4,350,479
	4,350,480

PATENTS

GRANTED SEPTEMBER 21, 1982

GENERAL AND MECHANICAL

4,349,920

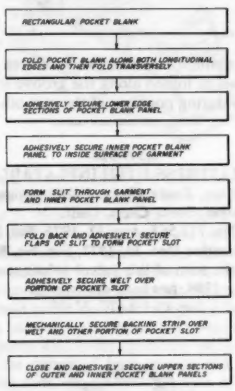
POCKET CONSTRUCTION

Joseph W. A. Off, Irving, Tex., assignor to Haggar Company, Dallas, Tex.

Division of Ser. No. 948,016, Oct. 2, 1978, Pat. No. 4,263,678, which is a continuation-in-part of Ser. No. 905,054, May 11, 1978, Pat. No. 4,156,293, which is a continuation of Ser. No. 819,843, Jul. 28, 1977, abandoned. This application Jul. 14, 1980, Ser. No. 168,503

Int. Cl.³ A41D *27/20*

U.S. Cl. 2—247 **31 Claims**


RECTANGULAR POCKET BLANK
FOLD POCKET BLANK ALONG BOTH LONGITUDINAL EDGES AND THEN FOLD TRANSVERSELY
ADHESIVELY SECURE LOWER EDGE SECTIONS OF POCKET BLANK PANEL
ADHESIVELY SECURE INNER POCKET BLANK PANEL TO INSIDE SURFACE OF GARMENT
FORM SLIT THROUGH GARMENT AND INNER POCKET BLANK PANEL
FOLD BACK AND ADHESIVELY SECURE FLAPS OF SLIT TO FORM POCKET SLOT
ADHESIVELY SECURE WELT OVER PORTION OF POCKET SLOT
MECHANICALLY SECURE BACKING STRIP OVER WELT AND OTHER PORTION OF POCKET SLOT
CLOSE AND ADHESIVELY SECURE UPPER SECTIONS OF OUTER AND INNER POCKET BLANK PANELS

1. In a method of constructing pockets in garment panels wherein a length of pocket material having reverse and obverse sides is connected to the garment panel, folded transversely to form inner and outer pocket panels, and secured at adjacent edges and ends of the folded length of pocket material; the improvement comprising the steps of:

positioning the reverse side of the length of pocket material on the inside surface of the garment panel wherein a pocket is to be formed;

adhesively securing the length of pocket material to the garment panel; and

physically separating and removing a predetermined discrete area of the length of pocket material and the adjacent portion of the garment panel and thereby forming a pocket slot of predetermined length and width directly through the garment panel and length of pocket material with the adhesive connection therebetween.

4,349,921

INTERVERTEBRAL DISC PROSTHESIS

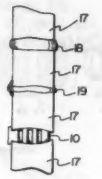
J. David Kuntz, 899 Lahakas Blvd., Kitimat, B.C., Canada

Filed Jun. 16, 1980, Ser. No. 159,843

Int. Cl.³ A61F *1/00*

U.S. Cl. 3—1 **52 Claims**

1. An intervertebral disc prosthesis, comprising a body of substantially rigid, non-porous, biologically compatible material having a superior surface, an inferior surface, opposed lateral surfaces and opposed anterior and posterior ends, each of said superior surface and inferior surface being substantially flat in the lateral-lateral direction over the entirety of said surfaces and, in the anterior-posterior direction, corresponding generally with the shape of a vertebral surface adjacent a disc space, and means located at one of said opposed anterior and



posterior ends for facilitating holding of the prosthesis during its insertion into said disc space.

4,349,922

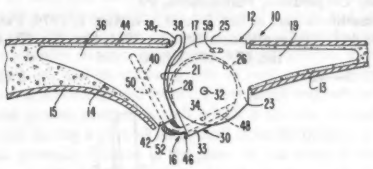
JOINT PROSTHESIS WITH IMPROVED ARTICULATION MEANS

John M. Agee, 3980 Bartley Dr., Sacramento, Calif. 95822

Continuation-in-part of Ser. No. 14,391, Feb. 22, 1979, abandoned. This application Mar. 23, 1981, Ser. No. 246,834

Int. Cl.³ A61F *1/03*

U.S. Cl. 3—1.91 **40 Claims**



1. A prosthesis for a joint of the human body with the joint being at the junction of a pair of normally aligned bones comprising: first and second elongated members, the first member adapted to be inserted into one of the bones adjacent to the joint and the second member adapted to be inserted into the other bone adjacent to the joint, the members having respective ends adjacent to each other when the same are inserted into respective bones; and means pivotally interconnecting the adjacent ends of said members, said means including a first element carried by one of the members for rotation relative thereto about a first axis, and a second element having a pair of relatively angularly disposed parts shiftably coupled with said first element and said second member, respectively, for rotation relative thereto about second and third axes, respectively, whereby said second member can pivot relative to the first member about any one of said axes without imparting substantial torsional and bending loads to the first member.

4,349,923

JET NOZZLE ASSEMBLY FOR THERAPY BATHS

Philip E. Chalberg, 1119 Maple Ave., Orange, Calif. 92668

Filed Dec. 12, 1980, Ser. No. 215,888

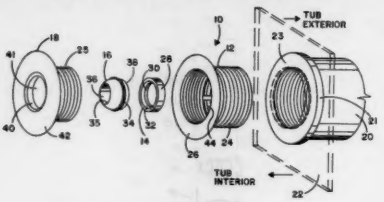
Int. Cl.³ A61H *33/02*

U.S. Cl. 4—542 **10 Claims**

1. A nozzle assembly for connection to a source outlet through an orifice in the wall of a whirlpool bath for controlling the direction of flow of a high velocity stream of aerated water into the bathtub, the assembly comprising:

a first cylindrical pipe fitting having an annular flange at one end for compressive engagement with said wall, and having means for securely engaging said source outlet,

a second cylindrical pipe fitting having an annular flange at one end for compressive overlapping engagement with said first fitting flange, and having means for securely engaging said first cylindrical pipe fitting in concentric relation therewith said second fitting flange completely blocking said first fitting flange from view,



a spherical member having a cylindrical channel for passage of said aerated water, said spherical member being rotatably seated within said second cylindrical pipe fitting, with said channel providing said flow direction control, and

means for rotatably securing said spherical member within said second cylindrical pipe fitting for limited rotation therein.

4,349,924

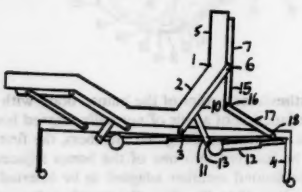
ADJUSTABLE BODY SUPPORTING ASSEMBLIES WITH FORWARD INCLINING HEAD SUPPORT

Henry C. Zur, Phoenix, Ariz., assignor to Goodman Manufacturing Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 41,354, Aug. 1, 1979, Pat. No. 4,258,445. This application Feb. 23, 1981, Ser. No. 236,433

Int. Cl.³ A61G *7/00, 7/06*

U.S. Cl. 5—68 **3 Claims**



1. An adjustable body supporting assembly comprising a horizontal frame member (4), a back support portion (1) pivotably connected to said frame member, and divided into a lower back support (2) and an upper head support (5) pivotable connected to said lower back support, and a single power means adapted to raise the lower back support and upper head support, from a horizontal position to angular positions in which the lower back support is inclined relative to the frame, and the upper head support is inclined relative to the frame and the lower back support.

4,349,925

PHYSIOLOGICAL PILLOW

James K. Macomber, 12 Gina Dr., Centerport, N.Y. 11721, assignor to James K. Macomber, Centerport, N.Y.

Filed Mar. 13, 1980, Ser. No. 130,154

Int. Cl.³ A47G *9/00*

U.S. Cl. 5—431 **8 Claims**

1. A pillow particularly useful for a person sleeping in a prone position with the head turned at least partially to one side comprising a cushion formed of soft yielding material and of a size to support the head and adjacent chest portion of a person using the pillow, said cushion having a head area to support the head of the person, a chest area to support at least a portion of the chest of the person, said cushion being tapered generally in a direction from said head area towards said chest area and said cushion having a groove extending at least part-

way across the cushion between the head area and the chest area so that it can be folded along the groove to facilitate the use of the pillow during positions of the user other than prone.

4,349,926

WATERBED MATTRESS WITH INFLATABLE MARGINS

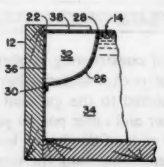
Howard A. Winther, Santa Clara, Calif., assignor to Liberty Vinyl Corporation, Santa Clara, Calif.

Division of Ser. No. 713,563, Aug. 11, 1976, Pat. No. 4,064,579. This application Dec. 19, 1977, Ser. No. 861,765

The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.

Int. Cl.³ A47C *27/08*

U.S. Cl. 5—452 **1 Claim**



1. In a waterbed mattress including a bladder formed of pliant sheet material defining a top panel, a bottom panel, and side panels joining said top and bottom panels at upper peripheral margins and lower peripheral margins respectively, said side panels being adapted to conform to a rigid, circumscribing peripheral framework preventing lateral distortion thereof, the improvement comprising: at least one supplemental panel of a pliant sheet material which internally spans said upper peripheral margins, sealably separating said bladder into a main chamber for containing a liquid and at least one upper corner chamber for containing a selected fluid, the cross sectional length of said supplemental panel being no greater than the total cross sectional lengths of the portions of said top panel and said adjacent side panel forming said upper corner chamber whereby said at least one upper corner chamber establishes the structural rigidity of said upper peripheral margins.

4,349,927

BEEHIVE IMPROVEMENTS

John Q. Adams, IV, 1206 Foxcroft Rd., Richmond, Va. 23229

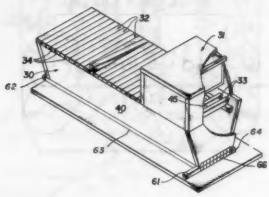
Filed Feb. 19, 1981, Ser. No. 236,112

Int. Cl.³ A01K *47/00*

U.S. Cl. 6—1 **4 Claims**

1. A beehive comprising a bottom board having a pair of side longitudinal locator strips fixed thereto in parallel relationship and having one end transverse locator strip fixed thereto between the longitudinal locator strips, the longitudinal locator

strips having interior longitudinal inclined faces, a hive body portion compriing connected vertical end walls which are trapezoidal and downwardly tapering and side walls which are inclined and downwardly convergent and adapted to engage matingly between the inclined faces of the longitudinal locator strips on the bottom wall, an overhead hive section resting bodily on the top edges of the inclined side walls of the hive body portion at one end portion of the latter, brood frames within the hive body portion beneath the overhead hive section and having transversely extending top bars, depressed support strips for the opposite ends of the top bars fixed to the interior surfaces of said side walls below the top edges thereof and disposed beneath the overhead hive section whereby the



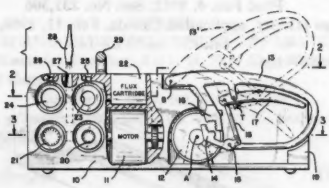
top bars of said brood frames are supported at an elevation below the bottom of the overhead hive section, said top bars being recessed in their opposite sides to form bee crawl spaces between the top bars when the latter are placed in side-by-side contacting relationship, whereby bees may travel from the brood frames in the hive body portion to the overhead hive section and vice-versa, filler strips for the recesses of the top bars to close said crawl spaces thereby enabling the hive body portion to be used alone without the overhead hive section, and honey frames within the remainder of the hive body portion beyond the overhead hive section and having top bars whose opposite ends rest on the top edges of the inclined side walls of the hive body portion.

4,349,928

MULTI-PURPOSE PLUMBING TOOL

Alexander T. Mlikotin, P.O. Box 1975, Santa Monica, Calif. 90406

Filed Nov. 28, 1980, Ser. No. 211,433
Int. Cl.³ B25F *1/00*
U.S. Cl. 7—157 **9 Claims**



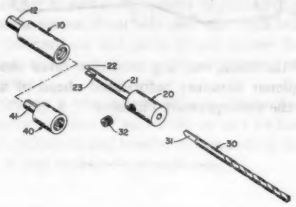
1. A multi-purpose plumbing tool including, in combination:
(a) an elongated portable frame;
(b) a high speed motor;
(c) a circular pipe saw coupled to said motor for high speed rotation about a transverse saw axis when said motor is started;
(d) a pipe vise including two pairs of jaws, one on either side of the plane of said circular saw; and
(e) pivot means on said frame at a point spaced from the pipe vise for enabling relative swinging movement to take place between said circular pipe saw and said pipe vise about a transverse pivot axis parallel to and spaced from said transverse saw axis,
whereby a pipe can be gripped by said pipe vise and engaged by the periphery of said saw so that further relative swinging movement about said pivot axis will cause cutting of the pipe by the saw, the pipe being held on either side of the cut made by the saw by the respective pairs of jaws as the cut progresses.

4,349,929

TWIST-LOCK CONNECTION AND TOOL UTILIZING SAME

George G. Dewey, Prospect Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jul. 31, 1980, Ser. No. 174,288
Int. Cl.³ B25F *1/10*
U.S. Cl. 7—158 **7 Claims**



1. Means for attaching a drill bit or the like to a power tool, said means comprising a first member having a longitudinal bore extending at least partially therethrough; protrusion means extending laterally into said bore at a first location, resilient spring means projecting into said bore at a second location spaced from the first location; a second member having a longitudinally extending shank which is received in the bore of said first member; said shank having a first groove extending longitudinally from a first end thereof and forming two generally radially extending walls disposed generally perpendicular to one another; a second groove extending laterally of, and intersecting one of said walls of said first groove at a point spaced from the first shank end; whereby the second groove creating a wall which is arcuate in configuration and having a portion inner most from the periphery of the shank generally located in the plane of the other of said two first groove walls, said first shank end may be inserted axially into said bore such that said protrusion means is received in said first groove, said second member rotated with respect to said first member to bring said protrusion means into engagement with said second groove to thereby prevent axial displacement between the first and second members and creating torque transmission mating bearing surfaces between the innermost wall portion of the second groove and the protrusion means, said resilient spring means frictionally engaging a portion of the surface of the shank to prevent undesired counterrotation of the second member relative to said first member.

4,349,930

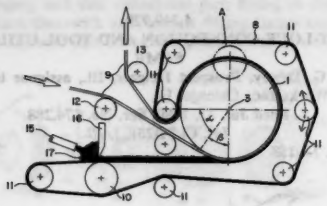
CONTINUOUS METHOD FOR UNIFORM FOAM TREATMENT OF PLANAR TEXTILE STRUCTURES

Kurt Van Wersch, Wegberg, and Manfred Pabst, Cologne, both of Fed. Rep. of Germany, assignors to A. Montforts, Monchen-Gladbach, Fed. Rep. of Germany

Filed Sep. 30, 1980, Ser. No. 192,230
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1979, 2939767
Int. Cl.³ D06B *5/08*
U.S. Cl. 8—151 **4 Claims**

1. Continuous method for uniform foam treatment of planar textile structures wherein a foamed treatment medium for finishing and/or dyeing is applied to the planar structure which is then subjected to underpressure, which comprises sucking the foam onto the planar structure to which the foam is to be applied, introducing the foam together with the planar structure into an underpressure chamber wherein the pressure is low compared to the internal pressure of the bubbles of the foam, applying the foam directly to the planar structure and,

prior to disintegration of the foam by applying underpressure thereto which is low compared to the internal pressure of the



bubbles of the foam, exerting a suction force onto the foam from the planar structure beforehand ahead of an inlet gap leading to the underpressure chamber.

4,349,931

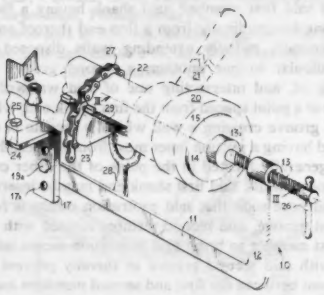
THREADING DIE COUPLE

Harry I. Leon, 924 Bowen St., NW., Atlanta, Ga. 30318

Filed May 27, 1980, Ser. No. 153,083

Int. Cl.³ B23G *5/04*

U.S. Cl. 10—123 P **12 Claims**



1. A tool couple for a threading die, which comprises:
(a) a frame having an elongated arm;
(b) a tailpiece to which the elongated arm is pivotally connected, said arm being movable during the threading operation about its pivotal joint with the tailpiece;
(c) means for anchoring the tailpiece in a fixed position relative to a cylindrical workpiece such as a pipe;
(d) a shaft supported by the frame, the longitudinal axes of the shaft and of the elongated arm being substantially parallel;
(e) means connected to the frame for moving the shaft toward the workpiece;
(f) a rotatable member which is supported by the shaft, a portion of the rotatable member being slidable about the shaft; and
(g) means for constraining said portion to slide around the longitudinal axis of the shaft, the distance from the longitudinal axis of the shaft to each point on said portion remaining approximately constant; said portion being adapted for physical contact with the threading die, so that an axial force can be transmitted from the tool couple through the frame of the threading die to points on the cutting edges thereof which are in contact with the workpiece.

4,349,932

DEVICE FOR UNIFORMLY PRESSING ON AND RELEASING THE PRESSURE FROM RUB-OUT BARS

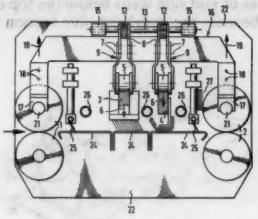
Eberhard Schörnig, Taunusstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 15, 1981, Ser. No. 254,450

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1980, 8010663[U]

Int. Cl.³ G03D *5/06*

U.S. Cl. 15—77 **4 Claims**



1. In a device for uniformly pressing on and releasing the pressure from, particularly oscillating, rub-out bars in an apparatus for developing printing plates including transport rolls and, if appropriate, squeezing rolls arranged in pairs, particularly in a horizontal position, with a bearing at each end of each upper roll, and means whereby each bearing and upper roll may be raised and lowered with respect to each lower roll,
the improvement comprising pivotal angle lever means, equipped with weight means, and having a lower arm with a pressure roll connected to the end thereof, said pressure roll being adapted to exert pressure on a rub-out bar in the lowered position of said each upper roll,
and lifting means for said angle lever means comprising bearing means adapted to seat on shaft means of said upper rolls, and connecting means between said bearing means and an upper arm of said pivotal angle lever means.

4,349,933

CURLING PUSH-BROOM

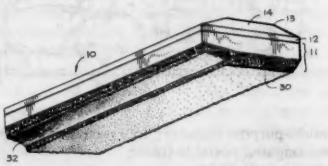
Albert N. Thompson, 539 Almey Ave., Winnipeg, Man., Canada (R2C 2Z2)

Filed Feb. 4, 1981, Ser. No. 231,306

Claims priority, application Canada, Feb. 11, 1980, 345392

Int. Cl.³ A63B *67/14*

U.S. Cl. 15—118 **16 Claims**



1. For use in a curling push-broom, a base plate having a bottom surface and a top surface; a fabric covering fixedly secured to the bottom surface and comprising:
(a) a first area whose outside margin is generally coincident with a first end and with a part of each of two opposite sides of said bottom surface;
(b) a second area whose outside margin is generally coincident with a second end opposite to said first end and with remaining parts of each of said two opposite sides of said bottom surface;
(c) said first area being covered by a first fabric, said second

area being covered by a second fabric whose coarseness is different from that of said first fabric;

(d) means for securing said base plate to handle means with said bottom surface turned away from the handle means; whereby a broom utilizing the base plate can be selectively applied for polishing and/or buffing the ice.

4,349,934

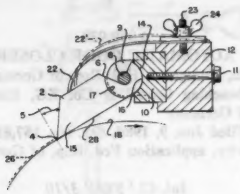
DOCTORING KNIFE FOR DRUM DRYERS AND FLAKERS

Thomas Margittai, c/o T.B.M. Technologies, Inc., 778 Cornwall Rd., State College, Pa. 16801

Filed Feb. 17, 1981, Ser. No. 234,985

Int. Cl.³ F26B *25/04*

U.S. Cl. 15—256.51 **8 Claims**



1. An improved doctoring knife for drum dryers and flakers of the type having a rotating drum upon which a product is deposited and a frame to which the doctoring knife is attached, said knife comprising:

(a) a plurality of knife blocks each having a cutting face and a bottom face which intersect to define a cutting edge, and

(b) a means for attaching the knife blocks to the frame in a manner such that each knife block can be separately removed and the knife blocks can be retained in a position where:

(i) the cutting edge of each knife block will contact the drum thereby defining a line of contact,

(ii) the bottom face of each knife block is in a plane which is substantially tangent to the drum at the line of contact,

(iii) the knife blocks cannot create sufficient radially-directed pressure to damage the drum, and

(iv) the blocks will be adjacent to one another with the cutting face of all knife blocks facing in one direction.

4,349,935

RUG AND CARPET CLEANING APPARATUS

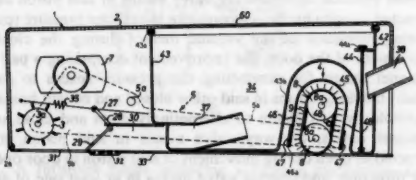
Leopold Knestele, Postfach 1241, D 7967 Bad Waldsee, Fed. Rep. of Germany

Filed Jul. 2, 1980, Ser. No. 164,532

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1980, 3002422

Int. Cl.³ A47L *11/30*

U.S. Cl. 15—320 **12 Claims**



1. In a rug and carpet cleaning apparatus having a suction source, a source of cleaning liquid and a head displaceable by a handle over a surface of a carpet or rug to be cleaned and connected with said suction source and said liquid source, said head being provided with a driving motor and a plurality of drivable units selectively engageable with said surface and adapted to be coupled with said motor for performing respective cleaning operations upon said surface, said head having a housing receiving said units, the improvement which comprises:

a rocker disposed in said housing and comprising a pair of members extending in a direction of displacement of said head and spaced apart to form opposite members of a frame;

means for pivotally mounting said rocker in said housing on an axis transverse to said direction whereby parts of said rocker to opposite sides of said axis can be brought selectively closer to said surface upon the tilting of said rocker in opposite senses about said axis, said units being respectively mounted on said parts of said rocker for selective approach to said surface, said motor being mounted on said rocker;

means forming a continuous driving connection between said motor and one of said units on said rocker; and

means actuatable on said handle for controlling the direction of tilt of said rocker about said axis.

4,349,936

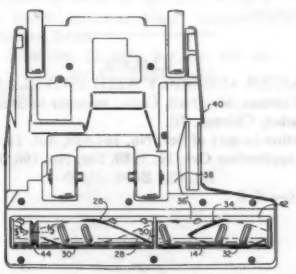
AGITATOR FOR A CLEANER OR THE LIKE

Emmett D. Lorson, Canton, and Keith G. Minton, North Canton, both of Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Feb. 25, 1981, Ser. No. 238,051

Int. Cl.³ A47L *5/30*

U.S. Cl. 15—366 **10 Claims**



1. A roll type agitator having brush strips and small, short abbreviated beater bars including;

(a) said small, short beater bars disposed around said agitator and angled obliquely relative to the axis of the agitator,

(b) said brush strips angling obliquely relative to the axis of said agitator with said brush strips being partly oriented in one angular direction and partly in the opposite angular direction said oppositely angled brush strips being offset around the periphery of said agitator roll at their contiguous ends,

(c) said contiguous ends being located at the suction opening of a cleaner supportably mounting said agitator roll,

(d) said small short beater bars being paired in adjacent obliquely angled, spiralling fashion, and

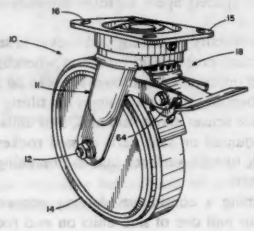
(e) said beater bars being angled towards said suction opening.

4,349,937

CASTER ASSEMBLY WITH SWIVEL LOCK AND BRAKE

Frank J. Fontana, Stratford, Conn., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Jul. 11, 1980, Ser. No. 167,680
Int. Cl.[3] B60B *33/60*
U.S. Cl. 16—35 R 13 Claims



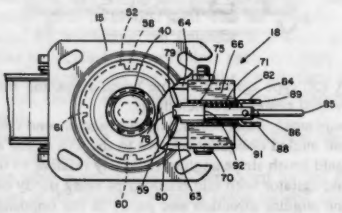
1. A caster assembly, comprising; horn means, an axle carried by said horn means, a wheel supported for rotation on said axle, a swivel plate mounted on said horn means for pivotal movement about an axis generally transverse to the axis of the wheel, a locking plate fixed to the swivel plate for movement therewith, a brake and swivel lock assembly carried by the horn means for substantially simultaneously engaging the swivel lock plate and the wheel to prevent swivelling and rotational movement of the wheel, the brake and swivel lock assembly including a brake and swivel lock member reciprocably mounted in the horn means, an operator member pivotally mounted in the horn means and engaging the brake and swivel lock member to shift the brake and swivel lock member into engagement with a swivel plate and the wheel, the brake and swivel lock member having an arcuate segment selectively engageable with the wheel, the wheel having a resilient tread surface, and said arcuate segment of the swivel lock member being rigid having a radius less than the radius of the tread surface on the wheel so that the ends of the arcuate segment bite into the tread surface to prevent rotation of the wheel in either direction.

4,349,938

CASTER ASSEMBLY WITH SWIVEL LOCK

Frank J. Fontana, Stratford, Conn., assignor to Stewart-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 167,680, Jul. 11, 1980. This application Oct. 14, 1980, Ser. No. 196,282
Int. Cl.[3] B60B *33/00*
U.S. Cl. 16—35 R 4 Claims



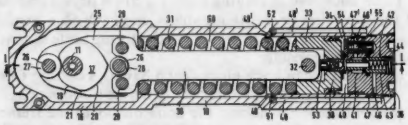
1. A caster assembly, comprising; a horn member, an axle mounted in said horn means, a wheel supported for rotation on said axle, a swivel plate mounted on said horn means for pivotal movement about an axis generally transverse to the axis of the axle, said swivel plate having at least one recess in the periphery thereof, a swivel lock member mounted on the horn member for reciprocating movement, said swivel lock member including a plunger having a projection selectively engageable with the recess in the periphery of the swivel plate, an actuator for withdrawing the plunger from the swivel plate and holding it in an active position, the plunger being pivotally mounted in the horn member and axially movable from an active position in engagement with the swivel lock plate to an inactive position pivoted 90 degrees with respect to the active position thereof, a transverse actuator member carried by the outer end of the plunger, and a U-shaped holding bracket on the horn member having spaced recesses in the ends thereof for receiving the transverse member and holding the plunger in its inactive position.

4,349,939

AUTOMATIC DOOR CLOSER

Horst Tillmann, Ennepetal, Fed. Rep. of Germany, assignor to Dorma-Baubeschlag GmbH & Co. KG, Ennepetal-Voerde, Fed. Rep. of Germany

Filed Jun. 9, 1980, Ser. No. 157,814
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924311
Int. Cl.[3] E05F *3/10*
U.S. Cl. 16—53 5 Claims



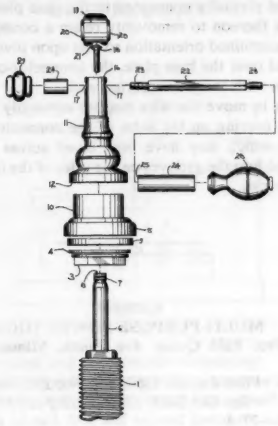
1. In an automatic door closer including an elongated housing having opposite closed ends; a closer shaft adapted to be connected to a door mounted in the region of one end of said housing turnable from a position in which the door is closed in either direction; a cam disc fixed to the closer shaft for turning therewith; a slide carrying a pair of rollers for cooperation with said cam disc for moving the slide in longitudinal direction of said housing during the turning of the closer shaft and the cam disc; a rod extending in longitudinal direction of said housing fixed at one end to said slide; a piston fixed to the other end of the rod and movable in a cylinder bore of said housing and dividing the interior of the latter into two pressure spaces; a compression spring surrounding said rod and abutting with opposite ends respectively against said piston and a stop formed in the housing to urge said piston toward the other closed end of said housing so as to reduce the volume of the one pressure space which is located between said piston and said other end of said housing and to move said slide to a position in which the rollers thereof cooperate with said cam disc to move the door connected to said closer shaft to the closed position; overpressure valve means in said piston constructed to open by the overpressure in said one pressure space during reduction of the volume thereof during the closing movement of the door, the improvement comprising a pair of channel means for connecting the pressure spaces to each other; blocking means in said other closed end of said housing movable by said piston to alternatingly open and close said channel means; one-way valve means in said piston constructed to open during movement of said piston in door opening direction; and control valve means in at least one of said channel means movable to a position permitting flow of fluid through said one channel means upon increase of pressure in said one pressure space; and adjustable throttle means in each of said channel means constructed to throttle the flow of fluid from said one to the other pressure space or completely stop such flow.

4,349,940

FAUCET HANDLE ASSEMBLY

Gary A. Fleischmann, and Clarence E. Klessig, both of Sheboygan, Wis., assignors to Kohler Co., Kohler, Wis.

Filed Jan. 26, 1981, Ser. No. 228,458
Int. Cl.³ E05B 7/00
U.S. Cl. 16—110 R 12 Claims



1. A faucet handle assembly or the like connectable to a support comprising:

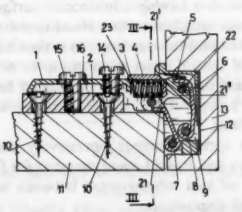
an open-ended sleeve which is connectable to the support by a fastener inserted and removed through the open end, the sleeve having aligned opposite cross openings near the open end; a cross member engaged within the cross openings; and a thimble that covers the open end and has opposite openings aligned with the cross openings, the cross member also engaged within the thimble openings to hold the thimble in place.

4,349,941

MULTI-PINTLE HINGE WITH SLIDING SPRING CLOSING MECHANISM

Erich Röck, and Josef Brunner, both of Höchst, Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Jun. 18, 1980, Ser. No. 160,737
Claims priority, application Austria, Jul. 4, 1979, 4649/79
Int. Cl.³ E05F 1/12
U.S. Cl. 16—288 6 Claims



1. A furniture hinge including a closing mechanism and comprising:

a hinge arm adapted to be mounted on a side wall of an article of furniture;

a hinge casing adapted to be mounted on a door of the article of furniture;

an inner hinge link and an outer hinge link connecting said hinge casing to said hinge arm, adjacent first ends of said inner and outer hinge links being pivotally connected to said hinge arm by respective axles, adjacent second ends of said inner and outer hinge links being pivotally connected to said hinge casing by respective axles, and said inner hinge link adapted to be positioned closer to the furniture side wall than is said outer hinge link when said hinge is connected to the article of furniture;

said hinge arm having a generally U-shaped cross-sectional configuration including a pair of legs adapted to be directed toward the furniture side wall and a web joining said pair of legs, said web having a forward end directed toward said hinge casing, said forward end of said web having therein a recess defined by a pair of inwardly extending lateral rims integral with said legs;

a retaining member mounted within said recess, said retaining member having on opposite sides thereof grooves receiving said rims, said retaining member being guided by said rims and grooves for linear movement only with respect to said hinge arm in opposite directions substantially parallel to the mounting plane of said hinge arm;

spring means for urging said retaining member linearly toward said hinge casing;

said outer hinge link including a sliding member directed generally toward said retaining member; and

said retaining member having at a forward end thereof a guiding member directed toward said sliding member, said guiding member including first surface means for, when said hinge casing is in a door-closed position or almost door-closed position, contacting said sliding member under the force of said spring means and imparting to said outer hinge link a torque tending to move said hinge casing in a door-closed direction, and said guiding member including second surface means separate from said first surface means for, when said hinge casing is in a door-open position, contacting said sliding member under the force of said spring means without imparting torque to said outer hinge link.

4,349,942

EASEL HINGE CONSTRUCTION

Leo T. Roy, South Attleboro, Mass., assignor to Craft, Inc., South Attleboro, Mass.

Filed Sep. 22, 1980, Ser. No. 188,765
Int. Cl.³ E05D 1/04
U.S. Cl. 16—376 9 Claims

1. In an easel hinge construction including an outer hinge plate and an inner hinge plate directly interconnected to each other for relative arcuate movement therebetween without a hinge pin, said outer hinge plate having a relatively flat leaf portion terminating in a curved barrel at the upper end thereof, said inner hinge plate also having a relatively flat leaf portion terminating in a curved barrel at its upper end, said inner barrel being positioned within said outer barrel for relative rotational movement so as to permit acute angular separation between said hinge plates from a closed position wherein the inner sides of said leaves are face-to-face to a relatively open position, the improvement comprising positive stop means for simultaneously preventing longitudinal sliding movement between said plates and for limiting the degree of angular separation therebetween in said open position, said stop means including at least one opening in said outer barrel, said outer barrel

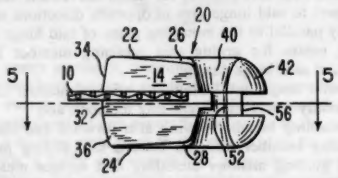
opening defined by a pair of longitudinally spaced side edges and a longitudinally extending lower edge, said inner barrel having a tang upwardly extending into said outer barrel opening, said tang engaging said outer barrel opening edges to prevent said longitudinal sliding movement, the terminal end of said tank engaging said lower edge when said plates are in their open position to thereby limit said angular separation.

4,349,943

SLIDE FASTENER STRINGER ELEMENTS WITH TONGUES AND GROOVED HEADS

George B. Moertel, Conneautville, Pa., assignor to Talon, Inc., Meadville, Pa.

Filed May 30, 1980, Ser. No. 154,649
Int. Cl.³ A44F *19/04*
U.S. Cl. 24—205.13 R **7 Claims**



1. A slide fastener stringer comprising a mounting tape, and a row of coupling elements attached to one edge of the tape; each element comprising

a body molded around the one edge of the tape,

a narrowed neck portion extending from the body away from the tape,

a head attached to the neck,

a pair of tongues extending outwardly from the neck,

the head having a longitudinal groove therein for receiving a tongue of each of a pair of adjacent elements in an opposing stringer, and

the groove and the tongues having widths perpendicular to a plane of the tape wherein the width of the groove is substantially greater than the width of the tongues,

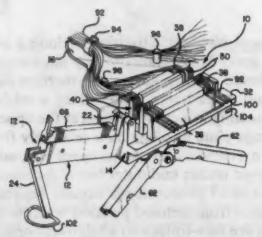
the tape, the tongues and the groove having top surfaces all of which are coplanar whereby a center plane of the tongues is upwardly offset relative to a center plane of the groove.

4,349,944

WIRE INSERTION TOOL

Edward L. Fickes, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 17, 1980, Ser. No. 207,309
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—566.4 **3 Claims**



1. A tool for inserting wires into grooves located on opposing sides of a connector cap, said tool comprising:

a. a base plate having mounted thereon a pair of spaced apart blocks each having wire-receiving guide slots across the upper surfaces, and a wire inserter movably positioned between the two blocks and consisting of two side plates spaced apart by and fastened to a bridge, said plates having wire-receiving slots in and along their upper edge and ribs extending down their inside surfaces, said ribs, plate slots and guide slots all being in alignment;

b. a head pivotally connected to the base plate and having means thereon to removably retain a connector-cap in a pre-determined orientation so that upon pivoting the head around over the base plate, the connector-cap is in registration with the wire inserter; and

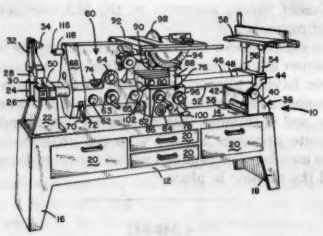
c. means to move the wire inserter upwardly with the side plates moving up the sides of the connector-cap so that wires which may have been laced across the slots are pressed into the grooves on the sides of the connector-cap by the ribs.

4,349,945

MULTI-PURPOSE POWER TOOL

Anthony Fox, 8306 Queen Ave. South, Minneapolis, Minn. 55431

Filed Jul. 21, 1980, Ser. No. 170,773
Int. Cl.³ B23P *23/02*; B23Q *1/14*
U.S. Cl. 29—27 A **7 Claims**



1. In a multi-purpose power tool of the type having a power head member with a motor driven tool supporting arbor extending from one edge thereof, said power head member being slidably mounted on tubular ways, a workpiece supporting carriage member slidably mounted on said tubular ways and movable therealong toward and away from said one edge of said power head member, the improvement comprising:

(a) a stand member having a horizontal surface;

(b) pivot means attached to said stand member and secured to one end of said tubular ways to maintain said ways in a parallel and spaced apart relationship to one another and allowing said tubular ways to be rotated between a horizontal and a vertical disposition with respect to said horizontal surface;

(c) a torsion spring member operatively coupled to said pivot means and to said stand member for facilitating the movement of said tubular ways between said horizontal and vertical dispositions;

(d) a rack gear formed on at least one of said tubular ways;

(e) a shaft journaled for rotation within said carriage member and having a pinion gear secured thereto and engagable with said rack gear;

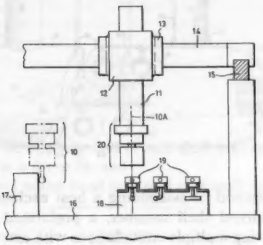
(f) an electric motor mounted within said carriage member in driving relationship with said shaft; and

(g) manually operable crank means selectively engagable with said shaft for rotating said shaft independently of said motor and moving said carriage member along said ways.

4,349,946
TOOL CONNECTING MECHANISM

David R. McMurtry, 'Undercroft', Wotton-under-Edge, Gloucestershire, England

Filed Mar. 31, 1980, Ser. No. 136,093
Claims priority, application United Kingdom, Mar. 30, 1979, 7911328
Int. Cl.³ B23Q 3/155
U.S. Cl. 29—57 5 Claims



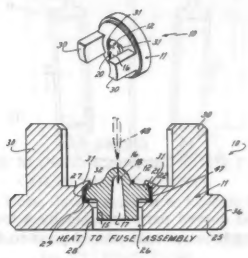
1. A tool connecting mechanism comprising:
a first connecting member adapted to support a tool;
a second connecting member for supporting said first member, each of said first and second members having three support elements arranged at three locations spaced apart on an axis, the support elements of one of said members extending radially outwardly and defining axially open spaces therebetween, and the support elements of the other member extending radially inwardly and defining axially open spaces therebetween;
urging means for axially urging said first connecting member in one sense of the direction of said axis into engagement with said second connecting member at said first and second support elements, one of said first and second support elements having axial projections, the other one of said first and second support elements defining axial recesses engageable by said projections under the force of said urging means, said projections and recesses being constituted in a kinematic support means and cooperating to positively locate said first connecting member on said second connecting member against displacement relative thereto transversely to and rotationally about said axis; and
means provided on said second connecting member defining space into which said first connecting member is movable in the other sense of said direction thereby to disengage said projections from said recesses and in which said first connecting member is rotatable into axial alignment between said support elements of said one connecting member and the spaces between said support elements of said other connecting member and thereby to free the first connecting member for axial withdrawal from the second connecting member in said one sense of direction.

4,349,947
METHOD FOR MANUFACTURING AN AIRLESS SPRAY NOZZLE

Alvin A. Rood, Oberlin, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Sep. 29, 1980, Ser. No. 191,935
Int. Cl.³ B23P 15/00, 13/00; B05B 1/06
U.S. Cl. 29—157 C 5 Claims

4. The method of manufacturing a spray nozzle comprising a nozzle tip and nozzle adapter, said nozzle tip being made from a hard, abrasive resistant material and said nozzle adapter being made from a material which is less hard, less abrasive resistant, and more easily mechineable than the material from which said nozzle tip is made, which method comprises,
forming on said tip a generally semi-spherical dome shaped external peripheral surface,
forming in said tip an axial approach passage terminating in a blind, generally semi-spherical end cavity coaxially aligned with said approach passage and said cone shaped peripheral surface,
drilling and counterboring an axial passage through said adapter, said counterbored portion of said axial passage extending inwardly from a front face of said adapter,
machining the front face of said adapter so as to form an annular lip on said front face between said counterbored passage and said machined portion of said front face,



milling opposite sides of said front face of said adapter to the depth of said annular lip so as to create a pair of spaced arcuate lips on opposite sides of the axial passage through said adapter,
inserting said tip into said counterbored axial passage of said adapter,
swaging said spaced lips over a portion of said tip so as to secure said tip within said bore,
applying sealing material between said tip to said adapter so as to form a liquid tight seal between the peripheral surface of said tip and the axial passage through said adapter and
forming a discharge opening in communication with said approach passage in said nozzle tip.

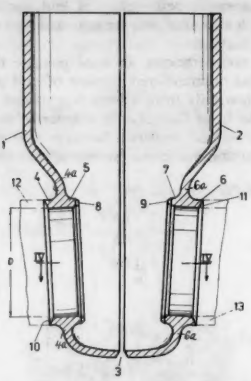
4,349,948
METHOD FOR MANUFACTURING METAL CASINGS FOR ACCESSORIES AND PARTICULARLY GATE VALVES

Erwin Müller, Herdecke; Bernd Kollmann, Witten; Ferdinand Sonnabend, Dortmund; Gert Petzolt, Nordkirchen; Josef Balz, Castrop-Rauxel; Bernhard Walloschek, Witten, and Friedrich Risse, Bochum, all of Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Feb. 7, 1980, Ser. No. 119,506
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1979, 2905744
Int. Cl.³ B23P 15/00
U.S. Cl. 29—157.1 R 2 Claims

1. A method of manufacturing a metal gate valve casing having a large nominal width over 200 mm and welded pipe connections to collars having a selected inside diameter on opposite sides of the said casing, comprising:
forming a bore of a diameter less than said selected diameter in each of two flat plates;
forming, in each bore of each flat plate, inwardly and outwardly extending tubular collars having said selected inside diameter, using a metal deforming tool;
holding and bracing said deformed inwardly and outwardly extending collars the surface of said selected inside diameter and a surrounding surface of each plate in the vicinity of each collar using upper and lower first die elements which expose a remainder of each plate;
forming said remainder of each plate into a three-dimensional curved part using upper and lower second die ele-

ments while maintaining said collars and surrounding surface in said upper and lower first die elements; and



joining said curved parts together by a longitudinal weld extending between said curved parts to form said valve casing.

4,349,949

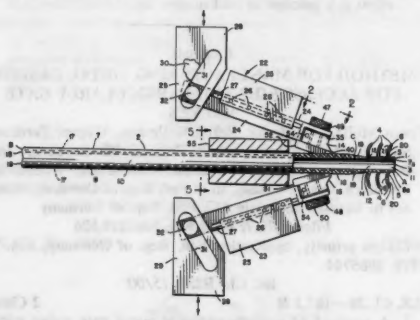
METHOD OF MAKING HEAT EXCHANGERS

Richard W. Kritzer, 400 E. Randolph, Chicago, Ill. 60601

Filed Nov. 5, 1980, Ser. No. 204,210

Int. Cl.³ B23P *15/26*

U.S. Cl. 29—157.3 A **6 Claims**



1. The method of forming fins on the surface of a heat exchange element which comprises the steps of

(a) feeding an elongated tubular body member longitudinally past a cutter,

(b) reciprocating said cutter forwardly and rearwardly toward and away from said surface at an acute angle and cutting into said surface during the forward movement thereof in a skiving action, thereby to form an upstanding fin, one side of which is integral with said body, and

(c) imparting relative vibration between said cutter and said body during said forward movement of said cutter,

(d) thereby to produce a roughened surface on the cutter-adjacent side of the fin thus formed.

4,349,950

HEAT EXCHANGER AND METHOD OF MAKING

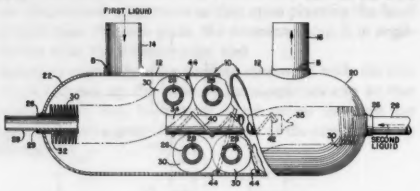
Donald R. Bowden, Huntsville, Ala., assignor to Solar Unlimited, Inc., Huntsville, Ala.

Division of Ser. No. 55,128, Jul. 5, 1979, Pat. No. 4,321,963.

This application Mar. 27, 1981, Ser. No. 248,111

Int. Cl.³ B23P *15/26*

U.S. Cl. 29—157.3 AH **2 Claims**



1. The method of assembling a heat exchanger having an outer cylindrical shell member, a preformed helical volute member having multiple convolutions with external fins whose outer peripheries fit into the shell member and whose inner peripheries define a central aperture and having end tubes extending from the convolutions axially of the shell member, and a core member shaped to fill the central aperture defined by the inner peripheries of the fins, including the following steps:

(a) winding a first helix of a wire whose diameter is small as compared with the diameter of a fin snugly around the core member with the same pitch as the volute member and securing the first helix to the core member;

(b) screwing the wound core member into the central aperture to fill the latter along the length of the convolutions;

(c) forming a second helix of wire whose diameter is small as compared with the diameter of a fin, the pitch of the second helix being the same as the pitch of the volute member and the outer diameter of the second helix being such as to permit the second helix to lie between the convolutions of the volute member and substantially tangent to a circle equal to the diameter of the inner surface of the shell member;

(d) interwinding the second wire helix with the volute member;

(e) inserting the volute member, the core member, and the interwound wire helices into the shell member; and

(f) closing the ends of the shell member and sealing the end tubes of the volute member to the shell member.

4,349,951

METHOD OF MAKING A KEY RING BOB

Michael W. Wefler, P.O. Box 524, Hobard, Ind. 46342

Filed Nov. 6, 1980, Ser. No. 204,567

Int. Cl.³ B23P *23/00, 17/04;* B21K *21/16*

U.S. Cl. 29—401.1 **2 Claims**

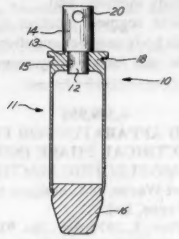
1. A method for producing a key chain bob with a bullet shape comprising the steps of:

(a) providing a shell casing having a thickened end wall forming a primer well and a side wall having an open end;

(b) providing a rod having a transverse bore through one end;

(c) providing a bullet head for said casing;

(d) boring a hole in said casing end wall at said primer well to enlarge the opening of the primer well;



(e) pressing the opposite end of said shaft into said enlarged end wall hole in a force fit; and

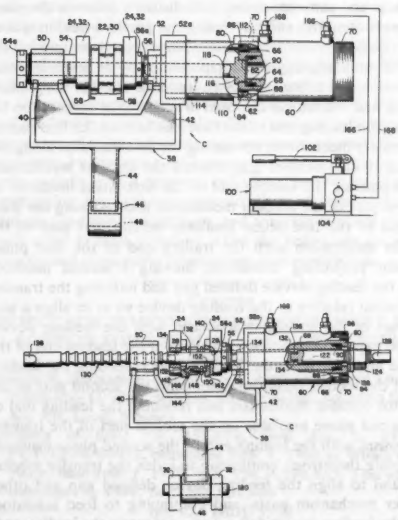
(f) seating said bullet head into said side wall open end.

4,349,952

APPARATUS AND METHOD FOR FIELD CONVERSION OF CORRODED PIVOTAL COUPLINGS TO NON-CORRODABLE COUPLINGS

Elmer L. Decker, Long Beach, and James Moon, Santa Ana, both of Calif., assignors to Quadco Alaska, Inc., Farmington, N. Mex.

Filed Apr. 28, 1980, Ser. No. 144,063
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—402.06 **28 Claims**



1. Apparatus for use in converting a pivotal coupling, which has become stuck and inoperative due to corrosive action on the engaged surfaces of its pivot pin and associated bearing surfaces, into a substantially non-corrosive coupling which comprises:

a frame structure for attachment to the stuck and inoperative coupling;

hydraulic means carried by said frame structure including a cylinder and reciprocable piston;

a pusher tool initially connectable to said piston and having an end engageable with an end of the stuck pivot pin, and upon energization of said hydraulic means being operative to apply pressure in a direction to axially remove the stuck pivot pin from its associated bearing surfaces; and

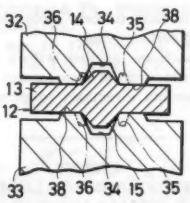
a broaching tool thereafter connectable to said piston in axial alignment with said bearing surfaces, and upon energization of said hydraulic means being operative to broach the bearing surfaces so as to increase their diameters to a size that will enable the mounting therein of new bearing liners of a substantially non-corrosive material for the reception of a new pivot pin of a substantially non-corrosive material.

4,349,953

METHOD OF MANUFACTURING SLIDE FASTENER COUPLING ELEMENTS

Takeo Fukuroi, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1980, Ser. No. 132,981
Int. Cl.³ B21D *53/50*
U.S. Cl. 29—410 **2 Claims**



1. A method of manufacturing slide fastener coupling elements, comprising the steps of:

(a) advancing a metal strip, comprised of an elongate web and an upper and a lower longitudinal medial land each disposed on an opposite side of the web, longitudinally between a pair of upper and lower dies each having a central recess and a pair of spaced side cavities spaced on opposite sides of the central recess;

(b) stopping the metal strip with the upper and lower longitudinal medial lands located in complete vertical registry with the central recesses of the upper and lower dies, respectively, and with the side cavities of the upper and lower dies disposed transversely on opposite sides of the centers of and in partial vertical registry with the upper and lower longitudinal medial lands, respectively;

(c) stamping the metal strip between the upper and lower dies to deform a portion of each of the medial lands into a transverse projection and a pair of spaced longitudinal teeth one on each side of the transverse projection with a pocket portion formed in the metal strip surrounded by the transverse projection and teeth and with a base extending around the transverse projection and teeth, said pocket portion and base being formed thinner than the metal strip web, and said transverse projection and teeth being formed partly of material squeezed from the pocket portion and base;

(d) blanking outer profiles of coupling element legs out of marginal edges of the metal strip web; and

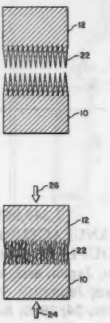
(e) thereafter, blanking out of the metal strip a coupling element including said transverse projection and teeth and said legs.

4,349,954

MECHANICAL BONDING OF METAL METHOD

Bruce A. Banks, Olmsted Township, Lorgin County, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 26, 1980, Ser. No. 210,632
Int. Cl.³ B23P *3/00, 25/00, 11/00*
U.S. Cl. 29—458 10 Claims



1. A method of joining two surfaces in a mechanical bond comprising

texturing said surfaces to form a plurality of close packed cones on said surfaces, and

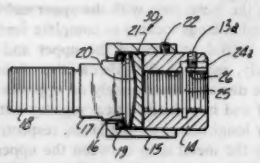
pressing said surfaces together with a force sufficient to cause plastic deformation of said cones whereby the cones buckle in random directions to permanently interlock them.

4,349,955

METHOD OF LOCKING A MALE MEMBER TO A FEMALE MEMBER

Ralph O. Keen, Roseville, Mich., assignor to Taper Line, Inc., Warren, Mich.

Division of Ser. No. 901,336, May 1, 1978, Pat. No. 4,252,458, which is a continuation-in-part of Ser. No. 684,348, May 7, 1976, Pat. No. 4,086,946. This application Sep. 11, 1980, Ser. No. 186,398
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—526 R 1 Claim



1. A method of locking a mutually engageable male body member to a female body member, said method comprising the steps of:

forming a longitudinal bore a predetermined distance into said female body member;

forming at least one slot concentric to said bore a predetermined distance into said female body member, said at least one slot defining a resilient segment portion of uniform circumferential width along its axial length;

forming a circumferential groove in said longitudinal bore at a predetermined distance substantially equal to said predetermined distance of said at least one concentric slot and communicating with said slot, such that said resilient segment portion freely deflects radially between the ends of said at least one slot;

inserting said male body member into said longitudinal bore of the female body member; and

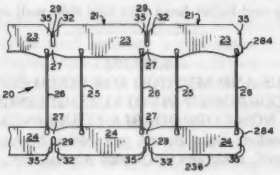
urging said resilient segment portion radially inward to engage said male body member and thereby lock said male body member to said female body member.

4,349,956

METHODS AND APPARATUS FOR FEEDING AND HANDLING ELECTRICAL PHASE INSULATORS FOR DYNAMOELECTRIC MACHINES

Fredrick Koenig, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Nov. 5, 1979, Ser. No. 91,081
Int. Cl.³ H02K *15/10*
U.S. Cl. 29—596 12 Claims



1. A method of placing phase insulators on a magnetic core having a pair of end faces, a centrally disposed axially extending bore, and a plurality of slots extending axially between the end faces and communicating with the bore; wherein the phase insulators comprise end turn insulating portions held in spaced apart relation by connector means; the method comprising the steps of: mutually aligning a gap defined by an insulator feeding device and a first part of an insulator transfer mechanism while a first insulator is disposed in such gap in preparation for loading the leading end of the first insulator on the first part of the transfer mechanism; advancing the first insulator along the feeding device defined gap toward the transfer mechanism, and depositing the leading end of the first phase insulator on the first part of the transfer mechanism and retaining the leading end of the first phase insulator on the first part of the transfer mechanism with the trailing end of the first phase insulator projecting therefrom; moving a second insulator along the feeding device defined gap and indexing the transfer mechanism relative to the feeding device so as to align a second part of the transfer mechanism with the feeding device defined gap in preparation for receipt of the leading end of the second insulator from the feeding device; feeding the leading end of the second phase insulator onto the second part of the insulator transfer mechanism and retaining the leading end of the second phase insulator on the second part of the transfer mechanism with the trailing end of the second phase insulator projecting therefrom; continuing to index the transfer mechanism and to align the feeding device defined gap and other transfer mechanism parts, and continuing to feed insulators from the feeding device defined gap and retain the leading ends of such phase insulators on the other parts of the transfer mechanism with the trailing ends of such phase insulators projecting from the transfer mechanism until a predetermined number of phase insulators are carried and retained by the transfer mechanism with the trailing ends thereof projecting therefrom; wrapping the trailing ends of the predetermined number of insulators about the transfer mechanism and holding the trailing ends of the predetermined number of insulators closely adjacent to the transfer mechanism; interfitting the transfer mechanism with the magnetic core along the bore of the core in mutually aligned relationship; and transferring the insulators from the transfer mechanism to the magnetic core.

4,349,957

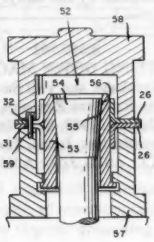
METHOD OF MAKING A BOBBIN WOUND STEPPING MOTOR

Robert S. Lundin, Northfield, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Continuation of Ser. No. 946,468, Sep. 28, 1978, abandoned. This application Apr. 30, 1980, Ser. No. 145,121

Int. Cl.³ H02K *15/02*

U.S. Cl. 29—596 22 Claims



1. The method of assembling the stator of a motor having at least two annular units each including an annular coil and a toroidal core structure containing said coil, each said core structure including first and second pole parts each having an annular pole portion and said pole parts having respective sequences of poles upstanding from respective circular margins of said annular pole portions and regularly distributed in alternation but spaced apart arcuately in cylindrical array, the poles of said first annular unit being offset arcuately from the poles of said second annular unit, each pole having an air-gap-bounding surface spaced by an air gap from the rotor of the motor, including the steps of assembling one pole part of each of two toroidal core structures with their annular pole portions in slideable abutment with each other in approximate concentricity and with the poles thereof extending in opposite directions and establishing said arcuately offset relationship between said sequences of poles, adjusting said sequences of poles into concentricity by engaging said air-gap-bounding surfaces of the poles radially with a common radially adjustable concentricity establishing device that presses radially in all directions against said air-gap-bounding surfaces, and securing the pole pieces to each other in axial abutment while the pole parts are in their arcuate and concentric relationship thus established.

4,349,958

DEVICE FOR TEMPERATURE MEASUREMENT AND A METHOD FOR THE MANUFACTURE OF SUCH A DEVICE

Hakan B. Hakansson; Lennart P. E. Persson, both of Lund, and Berth-Ove G. Wall, Bjärred, all of Sweden, assignors to Gambro AB, Lund, Sweden

Division of Ser. No. 131,079, filed Jul. 3, 1978 as PCT/SE78/00012, published Feb. 7, 1980 as W080/00191, 102(e) date Jun. 1, 1979, U.S. Pat. 4,296,633. This application Apr. 6, 1981, Ser. No. 251,468

Int. Cl.³ H01C *7/02*

U.S. Cl. 29—612 11 Claims

1. A method of manufacturing temperature measurement devices, comprising the steps of:

providing a sheet of electric insulating material;

providing one side of said sheet with electric conducting material to form a first electric conductor;

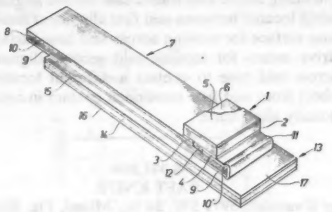
providing an opposite side of said sheet with electric conducting material to form a second electric conductor;

electrically short-circuiting said first and second electric conductors along one edge of said sheet;

removing a portion of one of said first and second electric conductors to form a gap therein extending generally parallel to said one edge of said sheet;

cutting said sheet along at least one line generally perpendicular to said gap and hence said one edge of said sheet to form a plurality of individual strips from said sheet;

providing each strip with its own temperature-sensitive sensor having a pair of electric contacts such that one



contact is electrically connected to said first electric conductor of said strip and the other contact is electrically connected to said second electric conductor of said strip, thereby forming a plurality of temperature measurement devices.

4,349,959

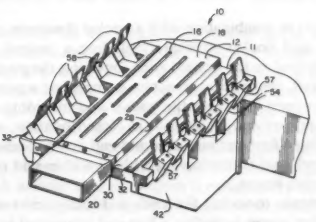
APPARATUS FOR ALIGNING BATTERY PLATES AND SEPARATORS

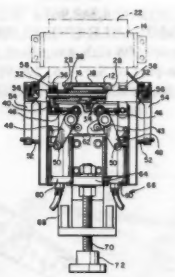
Todd A. Urban, Fleetwood, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed Apr. 14, 1980, Ser. No. 140,250

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—730 22 Claims





6. An apparatus for aligning battery plates and separators into stacks for use in an electric storage battery said apparatus comprising:

a. a frame;

b. a base surface disposed on said frame, said base surface dimensioned to receive a plurality of battery plates and separators;

c. first alignment means pivotally mounted to said frame and disposed on opposite sides of said base surface;

d. drive means for urging said first alignment means toward said base surface wherein said first alignment means will contact said plurality of battery plates and separators and align same;

e. second alignment means, said second alignment means extending above said frame, said second alignment means being located between said first alignment means and said base surface for moving across said base surface;

f. drive means for moving said second alignment means across said base to contact a different location on said plates from said first mentioned contact in order to additionally align same.

4,349,960

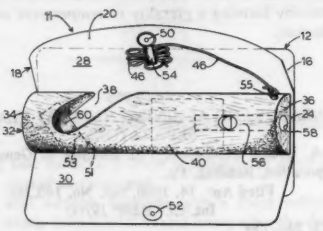
RAFT KNIFE

Wesley Kwasniak, 5979 SW. 56 St., Miami, Fla. 33155

Filed Dec. 19, 1980, Ser. No. 218,277

Int. Cl.³ B26B *11/00*

U.S. Cl. 30—153 **8 Claims**



1. A knife in combination with a pocket structure to be fixed to a raft, said pocket structure including a central zone and means attached to the central zone for fixing the pocket structure to a raft, said pocket structure comprising a pair of flaps, adapted to open and close the pocket and including means to close the pocket and maintain it in closed relation, a buoyant knife having a first end and a second end and a recess adjacent the first end, said recess having a blade within said recess and spanning said recess,

tether means to secure the knife and said pocket structure,

said tether means including a first end connected to the knife and a second end connected to the pocket structure.

4,349,961

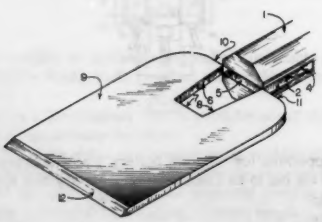
REMOVABLE CHISEL BLADE

Harlan C. Pendleton, 1606 12th Ave. West, Seattle, Wash. 98119

Continuation-in-part of Ser. No. 200,955, Oct. 27, 1980, abandoned. This application Sep. 29, 1981, Ser. No. 306,752

Int. Cl.³ B26B *3/00*

U.S. Cl. 30—168 **9 Claims**



1. A removable chisel blade capable of cleaning grout drippage from the surface of a concrete wall, comprising:

(a) a generally planar, metal body;

(b) a beveled prying edge on one end of the body; and

(c) a notch on the body, laterally opposite the edge, allowing frictional, removable interfitting and wedging of the body with a chisel shaft;

wherein the notch includes inwardly tapering side portions to improve the frictional interfitting and wedging of the body and shaft; and wherein the body includes beveled inset grooves at the end of the notch to enhance the frictional interfitting and wedging of the body and shaft and to reduce movement of the blade in the plane defined by the body.

4,349,962

CUTTING DOWN MACHINE

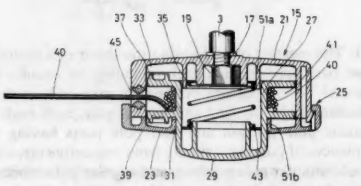
Hidehiko Itagaki, Kasukabe, and Yuji Suzuki, Akishima, both of Japan, assignors to Komatsu Zenoah Co., Japan

Filed Jul. 24, 1980, Ser. No. 171,789

Claims priority, application Japan, Jun. 14, 1980, 55-79620

Int. Cl.³ A01G *3/00*; A01D *50/00*

U.S. Cl. 30—276 **7 Claims**



1. A cutting down machine comprising:

a case driven through a rotating shaft by a prime mover which is rotatably supported by a supporting case;

said case comprising a case body having an inner peripheral surface, a bottom surface, an engaging portion on said bottom surface, and a cover member detachably mounted on said bottom surface;

a reel provided with a pair of flange portions axially spaced apart to define a groove for winding therearound and accommodating therein a cutting down tape, said flanged portions having an outer periphery in slidable confronting relation with said inner peripheral surface of said case to support the reel for rotation with and slidably disposed in the case and energized downward;

a number of first and second engaging portions disposed in confronting inner side surfaces of the case;

a number of first and second engaging protrusions engageable with said first and second engaging portions and placed in the vicinity of the outer peripheral portion of the reel;

engaging areas of said first and second engaging portions and of said first and second engaging protrusions being situated at an upper and a lower two positions;

said two engaging areas at the upper and lower portions being provided at different phases in a rotating direction; and

said reel having a pressing member at a lower portion thereof protruding downward from said cover member of the case.

4,349,963

ROTARY CUTTING WHEEL AND METHOD OF MAKING

Francis C. Peterson, St. Charles, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

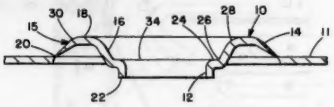
Filed Jan. 7, 1981, Ser. No. 223,080

Int. Cl.³ B26B *25/00*; B26D *1/14*; B21K *19/00*

U.S. Cl. 30—347 **6 Claims**

1. A one-piece sheet metal rotary cutting wheel for a can opener including a hub portion of predetermined diameter and axial dimension which includes a first, free, axial extremity and

a second, axial extremity, integrally merging with a wheel portion, the wheel portion including an inner and outer section interconnected by a bridge section, both the inner and outer section being generally frustoconical, the smallest diameter at the inner section being axially adjacent the second extremity of the hub and merging therewith, the largest diameter of the outer section presenting a cutting edge and also being axially



adjacent but radially spaced from the second extremity of the hub, the bridge region thereby interconnected the smaller diameter of the outer section and the larger diameter of the inner section, the outer section tapering in thickness from its smallest diameter and region of maximum thickness to its largest diameter and region of minimum thickness as a result of a cold forming process thereby presenting a hard, sharp, peripheral cutting edge.

4,349,964

VIEWING ANGLE MEASURING DEVICE FOR AUTOMOTIVE VEHICLES

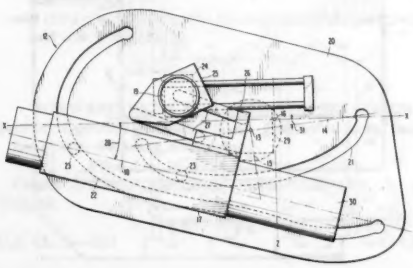
Ewald Vester, Waiblingen; Rolf Grüssaber, Murr; Wolfgang Küpper, Plochingen, and Horst Glatzhoefer, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 5, 1980, Ser. No. 156,793

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1979, 2925155

Int. Cl.³ G01B *11/00*

U.S. Cl. 33—264 **13 Claims**



1. A viewing angle measuring device for automobile vehicles, the measuring device comprising an elliptical template means corresponding to a visual ellipse, the template means having a governing curve and being adapted to be arranged in the vehicle at a prescribed relative position with respect to a driver's seat of the vehicle so that a center of the visual ellipse is disposed at a specific position and the visual ellipse is disposed at a predetermined axial inclination, a measuring beam projector means arranged on the template means so as to be guided with at least one of an optical axis of the projector beam and a measuring beam tangentially along the governing curve, and goniometer means connected with the measuring beam projector means for determining a direction of a measuring beam with respect to a reference plane as a measure for the viewing angle.

4,349,965

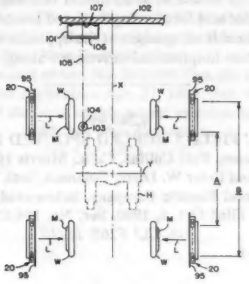
FOUR WHEEL ALIGNMENT METHOD AND APPARATUS FOR AUTOMOTIVE VEHICLES

Pierre A. Alsina, Rochester, N.Y., assignor to Security Trust Company of Rochester, Rochester, N.Y.

Filed Sep. 17, 1980, Ser. No. 188,035

Int. Cl.³ G01B *11/275*

U.S. Cl. 33—288 **15 Claims**



1. A method of checking the alignment of all four independently suspended wheels of an automotive vehicle and the like, comprising

positioning two pairs of spaced reflecting members adjacent opposite sides, respectively, of a space that is to be occupied one at a time by automotive vehicles of differing widths and wheel base lengths,

supporting the two reflecting members of each pair of limited reciprocation in aligned, horizontal paths, and generally parallel to the length of a vehicle positioned in said space,

after a vehicle has been positioned in said space, adjusting each of said members along its respective horizontal path, thereby to place a reflecting surface thereon in confronting relation with a wheel on said vehicle, and in a plane inclined to the plane containing said wheel, and in lateral registry with the reflecting surface on one of the members positioned at the opposide side of said space, and

directing a beam of light onto each of said reflecting surfaces in such manner that each beam is reflected by one of said surfaces horizontally toward an adjacent wheel on said vehicle.

4,349,966

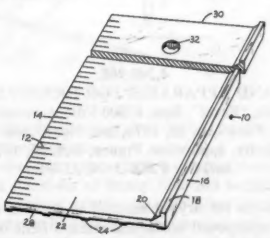
CUTTING GUIDE AND MEASURING DEVICE

Michael J. Marino, 223 Westville Ave., West Caldwell, N.J. 07006, and Michael R. Marino, 38 Alta Way, Corte Madera, Calif. 94925

Filed Mar. 19, 1981, Ser. No. 245,353

Int. Cl.³ B43L *7/00*

U.S. Cl. 33—489 **7 Claims**



1. A cutting guide and measuring device comprising:

an elongated flat base having ruled markings along one side of the upper surface, and an integral vertical raised flange along the opposite side forming a straight edge for guiding a cutting tool; and

at least three parallel longitudinal feet spaced across the width and extending along the lower surface of said base, said feet being integral with and of the same material as said base and flange and adapted to grip the surface of the material to be cut so as to inhibit sideways movement of said guide, said feet having rounded lower front and back longitudinal leading edges at the opposite ends of said base to facilitate longitudinal movement along said surface.

4,349,967

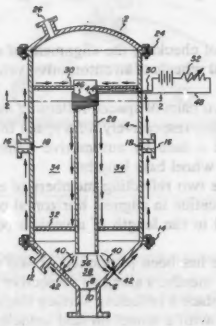
MAGNETIC FIELD COUPLED SPOUTED BED SYSTEM

Thomas B. Jones, Fort Collins, Colo.; Morris H. Morgan, Clifton Park, and Peter W. Dietz, Delanson, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,630

Int. Cl.³ F26B *17/10*

U.S. Cl. 34—1 **15 Claims**



1. A spouted bed device comprising:

a vessel for containing a bed of magnetizable granular material which vessel includes a vertically disposed lower base section and a fluid inlet disposed in the base section for entraining the magnetizable granular material;

a tubular member having an inlet positioned in the vessel spaced vertically above and in flow communication with the fluid inlet and an outlet terminating in an upper portion of the vessel whereby the entrained material flows through said tubular member from said inlet to said outlet and thereafter returns to said bed; and

means for forming a magnetic field oriented in the device with the lines of force extending between the tubular member inlet and a portion of the vessel base section adjacent the fluid inlet to regulate the flow of magnetizable granular material into the inlet of said tubular member.

4,349,968

PROCESS AND APPARATUS FOR DRYING MATERIAL

Henri Escande, "Favol", Bias, 47300 Villeneuve-sur-Lot, France

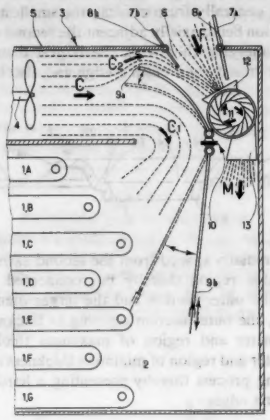
Filed Oct. 25, 1979, Ser. No. 87,948

Claims priority, application France, Oct. 26, 1978, 78 31001

Int. Cl.³ F26B *3/04, 13/06*

U.S. Cl. 34—13 **6 Claims**

1. In a process for drying material in an oven containing a plurality of superposed horizontal endless belts on which the material moves in a circuitous path from top to bottom in the oven; comprising establishing a stream of hot air in the oven, dividing the stream of hot air into first and second portions, directing said first portion toward and along the upper of said belts, mixing the second portion with relatively cool air from



outside the oven to form a mixed air stream, and directing said mixed air stream toward the lower of said belts.

4,349,969

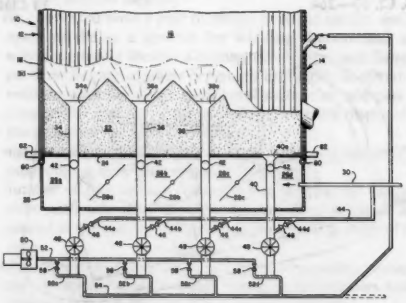
FLUIDIZED BED REACTOR UTILIZING ZONAL FLUIDIZATION AND ANTI-MOUNDING PIPES

Robert D. Stewart, Verona, and Robert L. Gamble, Wayne, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Sep. 11, 1981, Ser. No. 300,877

Int. Cl.³ F26B *17/00;* F22B *1/02*

U.S. Cl. 34—57 A **8 Claims**



1. A fluidized bed reactor comprising a housing, grate means supported in said housing and adapted to receive a bed of particulate material at least a portion of which is combustible, means defining an air plenum extending below said grate means, damper means in said air plenum for dividing said plenum into a plurality of chambers and for selectively controlling the passage of air through said chambers and said grate means to selectively fluidize the corresponding portions of said particulate material extending above said chambers, a pipe extending through each chamber and its corresponding bed portion, means associated with each pipe for selectively admitting pressurized air into said pipe for introducing said pressurized air into its corresponding bed portion to loosen the accumulated particulate material in said latter portion, valve means associated with each air admitting means for cutting off the flow of air into its corresponding pipe to permit the pipe to collect the particulate material building up in the correspond-

ing bed portion, and means associated with said pipes for collecting the latter material from said pipes.

4,349,970

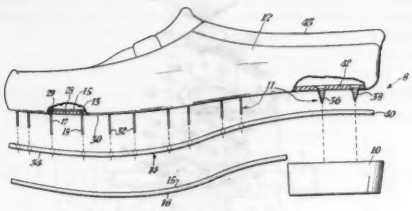
SHOE

Samuel Silver, 13953 SW. 66th St., Apt. 307, Miami, Fla. 33183

Filed Aug. 25, 1980, Ser. No. 180,604

Int. Cl.³ A43B 7/06, 13/28, 13/12

U.S. Cl. 36—3 B 10 Claims



1. A shoe comprising:

an upper, a lower member, an outer sole, and a heel; connecting means for securing said upper to said lower member, said heel and said outer sole;

said upper has a plurality of openings on the bottom of said upper for connecting said upper to said lower member;

said lower member constructed of at least partially synthetic material having a means for allowing the foot of a user in said upper to also breathe downward through said lower member, said lower member having a plurality of openings for connecting said upper to said lower member;

said connecting means including a first connecting means, a second connecting means and a third connecting means;

said first connecting means for passing through the openings in said lower member and the openings in said upper to fix said lower member to said upper;

said second connecting means for connecting said heel to said upper;

said third connecting means for connecting said outer sole to said lower member.

4,349,971

FORWARD LEAN ADJUSTER FOR SKI BOOTS

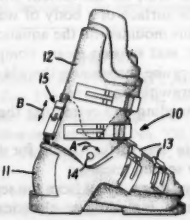
David C. Everest, III, Boulder, Colo., assignor to Lange International S.A., Fribourg, Switzerland

Filed Jan. 19, 1981, Ser. No. 226,010

Claims priority, application Switzerland, Oct. 3, 1980, 7388/80

Int. Cl.³ A43B 5/04

U.S. Cl. 36—121 18 Claims



1. A ski boot forward lean angle adjuster comprising a stand adapted to be secured to a boot lower, a slide plate adapted to be secured to a boot upper, operating means pivotally mounted on the stand and the slide plate and coupling them together, said operating means being movable between (1) an open or off position permitting relative movement between the stand and the slide plate and providing a free hinging ski boot, and (2) a closed or on position locking the stand and the slide plate against relative movement and providing a boot with a selected forward lean angle.

4,349,972

SHELLFISH DREDGE CHAFING GEAR

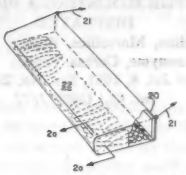
Walter J. Bruce, Jr., New Bedford, and Wayne M. Bruce, South Dartmouth, both of Mass., assignors to Bruce's Splicing & Rigging Co., Inc., New Bedford, Mass.

Continuation-in-part of Ser. No. 201,496, Oct. 28, 1980, Pat. No. 4,328,629. This application Apr. 27, 1981, Ser. No. 257,568

The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.

Int. Cl.³ A01K 73/02

U.S. Cl. 37—55 18 Claims



1. A shellfish dredge chain bag having means for protection from wear caused by dragging on the ocean floor in the form of an array of elongated strips of reinforced rubber,

said strips having forward ends attached to the bottom of said chain bag in the manner to trail beneath said chain bag in a protective relationship to the underside of said bag,

wherein at least a portion of said elongated strips are segments cut from tread sections of used vehicle tires, the tread surfaces facing downwardly.

4,349,973

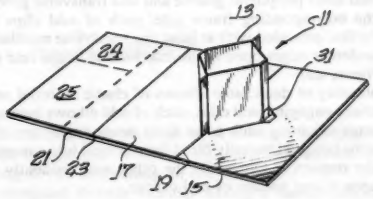
POP-UPS AND METHODS OF MAKING

Ib Penick, Prospect Heights, and John K. Volkert, Northfield, both of Ill., assignors to Compak Systems, Inc., Northfield, Ill.

Continuation-in-part of Ser. No. 934,202, Aug. 16, 1978, Pat. No. 4,212,231, which is a division of Ser. No. 746,340, Dec. 1, 1976, Pat. No. 4,146,983. This application Mar. 21, 1980, Ser. No. 133,493

Int. Cl.³ G09F 1/00

U.S. Cl. 40—124.1 27 Claims



1. A method of making an item of the character described, which method comprises

providing sheet material which is proportioned to create a folder in the form of facing first and second basepieces adapted to pivot relative to each other along a substantially common line between open and closed positions and to create a pair of pop-up elements, all of which are originally interconnected in said sheet material,

forming a pair of hinge elements in said sheet material,

associating at least one of said pop-up elements with a first

surface of said first basepiece positioned adjacent a peripheral edge thereof and effecting adhesive attachment between said pop-up element and said first basepiece at one of said hinge elements,

following said association and said adhesive attachment, simultaneously severing said sheet material along said peripheral edge of said first basepiece and along a peripheral edge of said associated pop-up element to free said pop-up element from an original interconnection,

adhesively attaching said pair of pop-up elements to each other,

superimposing said basepieces with said first surface of said first basepiece facing inward toward said second basepiece, and

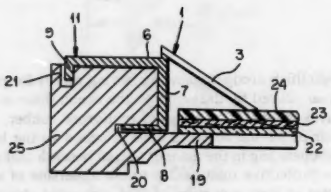
adhesively attaching the other of said pop-up elements to said second basepiece at the other of said hinge elements.

4,349,974

ASSEMBLY FOR MOUNTING A PICTURE TO BE DISPLAYED

Christian Rapayelian, Marseilles, France, assignor to Societe Brio, Societe Anonyme, Corbas, France

Filed Jul. 8, 1981, Ser. No. 281,371
Int. Cl.³ G09F *1/12*
U.S. Cl. 40—156 **6 Claims**



1. An assembly for mounting a flat carrier of rectangular outline bearing a message to be displayed, comprising:

a four-sided frame with a rabbeted inner periphery forming a planar abutment for a front surface of said carrier, said frame being provided on at least two opposite sides with an inner peripheral groove extending parallel to and rearwardly of the plane of said abutment and with a transverse groove extending on a rear face of said frame parallel to said inner periphery;

a plurality of clips of elastic material engaging said frame on said opposite sides, each of said clips overlying part of said rear face and having a channel profile with mutually perpendicular first and second lips respectively entering said inner peripheral groove and said transverse groove of the corresponding frame side, each of said clips being further provided with at least one transverse mortise with undercut edges open to the interior and to the rear of the frame; and

a plurality of detachable elbows of elastic material respectively engaging said clips, each of said elbows having two arms adjoining each other at an acute angle, one of said arms being frictionally fitted from behind into a mortise of the respective clip while the other arm resiliently bears upon a rear surface of said carrier.

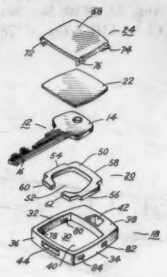
4,349,975

KEY ATTACHMENT

Wayne L. Chubb, P.O. Box 531, Beverly Shores, Ind. 46301

Filed Mar. 5, 1981, Ser. No. 240,845
Int. Cl.³ G09F *3/00*; A44C *3/00*; G09F *3/18*
U.S. Cl. 40—330 **11 Claims**

1. A key attachment for affixing identifying information to a key, comprising a handle having a body with a bottom, and side, top and botton walls joined to said bottom and defining a recess in the handle for receiving the head of the key, means in said recess for holding the head of the key in a substantially fixed position relative to said handle, one of said walls of said handle having an opening through which the shank of the key extends, a sheet on which the identifying information is placed adapted to fit in said recess on top of the head of the key, a



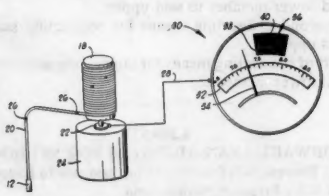
cover having a transparent portion through which the sheet with identifying information thereon is visible, cover securing means disposed on opposite sides of said cover, and recess means in the inner side of opposite walls for receiving said securing means for locking the cover onto said body.

4,349,976

APPARATUS FOR LOCATING AN AQUATIC ENVIRONMENT WITH A PH PREFERRED BY LARGEMOUTH AND STRIPED BASS FISH

Loren G. Hill, 1125 Westbrooke Ter., Norman, Okla. 73069

Division of Ser. No. 755,249, Dec. 29, 1976, Pat. No. 4,103,447.
This application Jul. 28, 1978, Ser. No. 929,005
Int. Cl.³ A01K *97/00*
U.S. Cl. 43—4 **2 Claims**



1. An apparatus for locating within a body of fresh water an aquatic environment with a pH within a predetermined range preferred by Largemouth and Striped Bass fish which comprises:

a surface aquatic craft for movement from one location to another on the surface of a body of water;

pH sensing means mounted on the aquatic craft for contacting the water, said sensing means comprising:

a pH sensing probe for sensing the pH of the water upon contact therewith; and

means for extending and retracting the probe relative to the craft;

means carried in the surface craft for indicating the pH sensed by the sensing means;

means for transmitting a signal from the sensing means to the indicating means, including an electrical lead connecting the sensing means to the indicating means; and

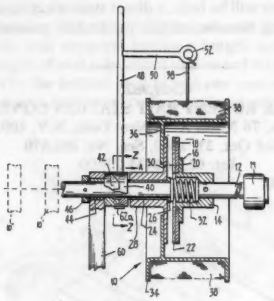
means in the craft in juxtaposition to said indicating means for sensibly portraying a range of pH values of from 7.5 to 8.0 corresponding to aquatic pH values characteristic of the aquatic pH preferred by bass, and facilitating immediate recognition of pH values within said range when they are indicated by said indicating means.

4,349,977

AUTOMATIC FISHING APPARATUS

Marcus T. Brodribb, Currie, and Antony G. Brodribb, Tribunna, both of Australia, assignors to King Reel Proprietary Limited, Tasmania, Australia

Filed Mar. 4, 1980, Ser. No. 127,090
Claims priority, application Australia, Feb. 1, 1980, PE2211
Int. Cl.[3] A01K *89/017*
U.S. Cl. 43—15 6 Claims



1. Automatic fishing apparatus including:
reel means for holding a fishing line,
a rotatable shaft supporting said reel means for selective rotation with or independent of said shaft;
driving means for driving said shaft continuously regardless of whether the reel means is selected to rotate with the shaft or independently thereof, and, actuating means for selectively coupling said reel means to the shaft for rotation therewith and for uncoupling said reel means from the shaft, said actuating means including a clutch assembly having clutch plates normally separated by a biassing member, said clutch plates including a driving clutch plate fixed for rotation with said shaft and a driven clutch plate mounted rotatably on said shaft and supporting said reel means and a line engaging member mounted pivotally on said shaft for movement from a first position to a second position as a result of a fish being hooked on said fishing line and causing increased line tension, said line engaging member having a hub portion arranged in operative abutting relationship with said driven clutch member and being associated with a cam assembly which, upon pivotal movement of said line engaging member from its said first position to its second position, causes said hub portion to move axially along said shaft and urge said driven clutch plate into engagement with said driving clutch plate to couple said reel means to said rotating shaft to reel in said fish, and once the fish is reeled in, said line engaging member being movable from the second position to the first position to uncouple the reel means from the shaft.

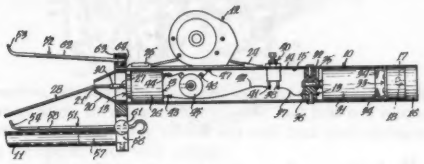
4,349,978

MOTORIZED FISHING APPARATUS

Charles R. Philip, Box 116, Haugen, Wis. 54841

Continuation of Ser. No. 896,238, Apr. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 705,947, Jul. 16, 1976, Pat. No. 4,084,342. This application Nov. 14, 1979, Ser. No. 94,271
The portion of the term of this patent subsequent to Apr. 18, 1995, has been disclaimed.
Int. Cl.[3] A01K *87/00*
U.S. Cl. 43—19.2 6 Claims

1. A fishing device, comprising: a handle; an elongate rod having a rear end portion and a projecting forward end portion, the rear end portion being secured to the handle; line guide means positioned forwardly of the handle, said line guide means including a line guide member; a fishing line secured at one end to the handle and having a free end provided with bait means and/or lure means and being suspended from the forward end portion of the rod, the line extendng through the line guide means to afford a line extension spaced from the rod and extending between the handle and the line guide means, the line extension being normally urged toward a straight-line condition by gravity applied to the free end of the line; a drive motor carried by the handle; an arm spaced laterally of the rod and rotatively driven by said motor, said arm having an eccentric portion which moves through an arcuate path when the motor rotates the arm, the eccentric portion being positioned to engage and deflect said line extension to cause movement of



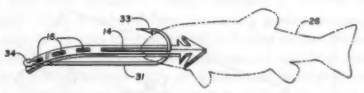
the free end of the line; a rheostat electrically connected to the motor for varying the speed of rotation of the motor and the angular velocity of said arm so as to vary the deflection of the line extension by the eccentric portion and the range of movement of the free end of the line and to afford a first way of adjusting the magnitude of deflection of said line extension; and adjustable means are provided for the line guide member to afford selective adjustable movement to said line guide member to vary the position of the line extension with respect to the eccentric portion of the arm so as to change the magnitude of deflection of the line extension and to afford an additional way of adjusting said magnitude of deflection.

4,349,979

BAIT FISH HOLDER

Ralph M. Strantz, St. Paul, Minn., assignor to Lund Lures, Inc., Spring Park, Minn.

Filed Sep. 22, 1980, Ser. No. 189,639
Int. Cl.[3] A01K *83/06*
U.S. Cl. 43—44.8 4 Claims



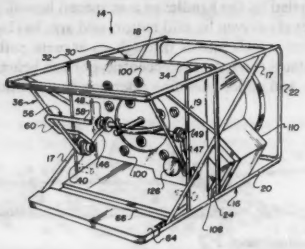
1. In combination with a fish hook having a barbed point at one end thereof and an eye at the other end thereof, a bait retaining device comprising, in combination:
an elongated flexible member having a barbed projecting means at a distal end thereof for insertion into the mouth of a bait fish and into the gill structure thereof for securing said bait fish to said member, said member also having at least one eye aperture means at the proximai end thereof for receiving the eye portion of said fish hook when inserted therethrough, said member also including further aperture means intermediate said proximal and distal ends for receiving the barbed point of said fish hook therethrough after said barbed point is inserted through the mouth of said bait fish when said member has been inserted into the mouth of said bait fish.

4,349,980

RODENT EXTERMINATING APPARATUS

James E. McKee, Suite 580, States General Life Bldg., 708 Jackson, Dallas, Tex. 75202

Filed Aug. 18, 1980, Ser. No. 179,168
Int. Cl.³ A01M *23/14*
U.S. Cl. 43—81 **22 Claims**



15. An improved apparatus for exterminating rodents and the like and characterized by:

a frame including spaced apart interconnected perimeter members and a transverse member mounted between said perimeter members;

striking means including a striking bar pivotally mounted on said frame for movement from a retracted position to a striking position;

a power actuator supported on said transverse member for driving said striking means between said positions;

an enclosure disposed around said frame and substantially enclosing said apparatus;

an opening in said enclosure in proximity to said striking means;

sensing means disposed within said enclosure for sensing the presence of a rodent or the like in proximity to said striking means; and

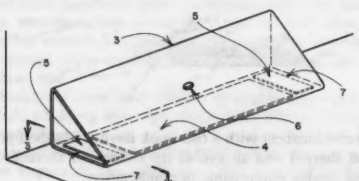
control means responsive to the sensing of the presence of a rodent by said sensing means for causing said power actuator to move said striking means from said retracted position to said striking position and return to said retracted position.

4,349,981

CONTACT POISON DELIVERY DEVICE

Daniel S. Sherman, 76 Ninth Ave., New York, N.Y. 10011

Filed Aug. 20, 1980, Ser. No. 179,775
Int. Cl.³ A01M *25/00*
U.S. Cl. 43—131 **4 Claims**



1. A contact poison delivery device for depositing a particulate poison on the feet and fur of a rodent traversing at least a portion of its length, wherein the device comprises a thin walled elongated open-ended triangular tubular member, dimensioned to form a restricted passageway for rodents entering the device, and having a vertical wall member, a horizontal wall member, and an angled wall member; wherein,

the said angled wall member is provided with a centrally disposed aperture, which permits the introduction of particulate poison into the interior of the device, intermediate the ends,

the said horizontal wall member is provided with poison retention means adjacent its ends,

at least one of the said wall members being provided with means for inducing the frenzied activity of a rodent upon contact therewith, disposed intermediate the ends of said at least one wall member, and

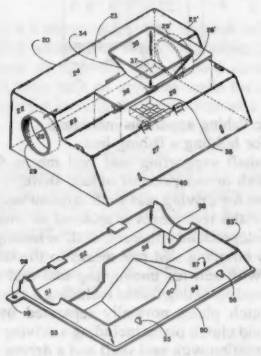
wherein the vertical wall member, the horizontal wall member, and the angled wall member are fabricated from a material which will create a static electric charge, by the contact of the rodents fur with the interior walls of the device, whereby there will be both, a direct static electric attraction, and a rubbing transfer, of the particulate poison onto the rodents fur.

4,349,982

REFILLABLE RODENT BAIT STATION CONTAINER

Daniel Sherman, 76 Ninth Ave., New York, N.Y. 10011

Filed Oct. 31, 1980, Ser. No. 202,670
Int. Cl.³ A01M *25/00*
U.S. Cl. 43—131 **7 Claims**



1. A rodent bait station container comprising;

a base member and an apertured cover member which in their assembled relationship form a unit having plurality of chambers, wherein one of said chambers forms a feeding station, and another of said chambers forms a bait tray element, said cover member further comprising,

a centrally disposed aperture on the face of said cover member, which cooperates with a moveable metered load element mounted on said cover member, and moveable from a first position out of registry with said aperture, and moveable to a second position in register with said aperture to deposit bait into said bait tray element, wherein

the bait tray element is provided with a raised central portion which divides the bait tray element into two separate bait tray portions, and

the configuration of the raised central portion of the bait tray element is such that bait deposited through the central aperture of the cover member tends to accummulate in the two tray portions.

4,349,983

PLAYSET FOR TOY VEHICLES

Eugene J. Kilroy, Palos Verdes Estates; William J. Kelley, Torrance, and Philip W. Crain, San Pedro, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

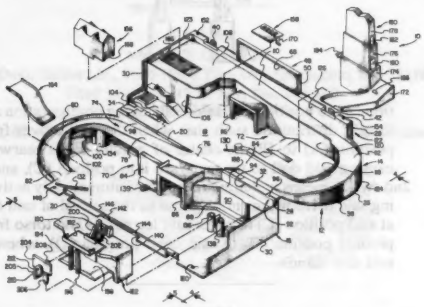
Filed Feb. 9, 1981, Ser. No. 232,758
Int. Cl.³ A63H *33/00*
U.S. Cl. 46—12 **5 Claims**

1. In combination with a portable representation including an openable and closeable carrying case having two case portions, each of said case portions having a bottom wall and a sidewall, a first unitary sheet secured to the interior of one of

said case portions, a second unitary sheet secured to the interior of the other of said case portions, each of said sheets having integrally formed therewith a plurality of objects simulating a scene found in a selected human environment, said carrying case having sufficient interior room to accomodate said scene-simulating objects without interference when closed to serve as a storage and carrying means therefore, the improvement which comprises:

first means for hingedly connecting the top of a sidewall of one of said case portions to the bottom wall of the other of said case portions;

supports depending from said bottom wall of said other case portion, said supports having a length corresponding to the height of said sidewall of said one of said case portions, whereby the bottom wall of said one case portion may be placed on a horizontal surface and said other case portion



may be swung 180° about said first means whereupon said supports and said first means will support said other case portion in a horizontal plane passing through the top of said sidewall of said one of said case portions; and

second means on the front edge of the bottom wall on said one case portion and third means adjacent the upper edge of the sidewall on said other case portion for connecting the front edge of the bottom wall of said one case portion to the upper edge of the sidewall on a second carrying case having structure corresponding to said third means, the sidewall on said other case portion and said bottom wall on said one case portion, said scene-simulating objects including a pathway for toy vehicles extending in serpentine fashion from the upper portion of a sidewall of said other case portion to said bottom wall thereof and thence along said top of the sidewall of said one of said case portions to the bottom wall thereof.

4,349,984

PRESCHOOL ASSEMBLY TOY

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356, and Anita J. Goldfarb, Tarzana, Calif., assignors to Adolph E. Goldfarb, Tarzana, Calif.

Filed Feb. 11, 1981, Ser. No. 233,493

Int. Cl.³ A63H *33/06*

U.S. Cl. 46—17 **10 Claims**

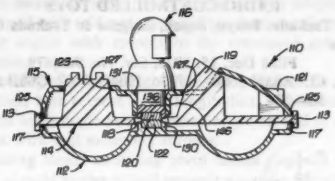
1. A simple multi-piece assembly toy for young children comprising at least three relatively large parts, the smallest of said parts being at least 1½ inch in at least one direction and at least ½ inch another direction;

(a) a first part;

(b) a second part designed to be positioned adjacent to the first part;

(c) a third part designed to be positioned adjacent to the second part;

said parts combining when positioned adjacent to one another to form the representation of a particular object visually identifiable by the child; first means on the parts which mechanically interengage to limit relative movement between said parts in only a first direction, while allowing them to be separated in a second direction generally transverse to said first direction; and second means on the parts which magnetically interengage to limit relative movement between the parts in said second



direction; said second means being engaged and disengaged by motion solely in said second direction, said first and second parts representing a toy vehicle and said third part representing the operator for such vehicle.

4,349,985

STEAM PRESSURE-PROPELLED TOY

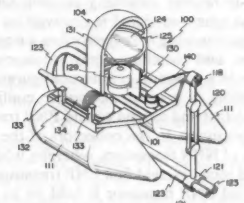
Tatsuya Kodaka, 25-6, 1-chome, Wakamiya, Nakano-ku, Tokyo, Japan

Filed Jun. 17, 1980, Ser. No. 160,356

Claims priority, application Japan, Jul. 17, 1979, 54-90505; Aug. 22, 1979, 54-105983; Jan. 30, 1980, 55-8784; Jan. 30, 1980, 55-8785

Int. Cl.³ A63H *23/06*

U.S. Cl. 46—95 **12 Claims**



1. A steam toy comprising a base structure having a front and a rear, float means comprising a pair of spaced apart float members for floatably supporting said base structure on a body of water, said base structure being disposed to overlie said spaced apart float members, first mounting means mounting said float means on said base structure, a boiler means, second mounting means mounting said boiler means on said base structure above the level of said body of water, said second mounting means comprising a windshield detachably mounted on said base structure, said boiler means being mounted on an upper portion of said windshield, a heat source disposed on said base structure in a position underlying said boiler means, a pair of pipes leading externally from said boiler means, each of said pipes having one end connected to said boiler means above the level of said body of water and each having its other end disposed below the level of said body of water when the float means floatably supports said base structure on said body of water, said pair of pipes extending from said boiler means forwardly and then curving rearwardly in U-shaped fashion to pass between said two float members and extend toward the rear of said base structure, and third mounting means mounting said other end portions of said pipes below the level of said body of water to thereby provide for propulsion of said steam toy as fluid exits from said pipes, said third mounting means comprising a first arm pivotably mounted from the rear of said base structure and extending in cantilever fashion beyond the

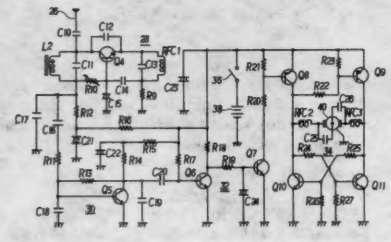
rear of said base structure, and a second arm connected to said first arm and extending downwardly to support said other end portions of said pipes.

4,349,986

RADIO-CONTROLLED TOYS

Mitsuo Tsukuda, Tokyo, Japan, assignor to Tsukuda Co., Ltd., Japan

Filed Dec. 15, 1978, Ser. No. 969,679
Int. Cl.[3] A63H *30/04, 17/36;* H04Q *7/02;* G08B *5/22*
U.S. Cl. 46—254 1 Claim



1. A radio-controlled toy comprising a transmitter which has a transmission power affording an effective transmission range of at least 2 to 3 m and which is designed to transmit a signal amplified and modulated with a low-frequency square signal by the supply of power effected by closing a switch, a d.c. motor, a receiver, and a d.c. power source, said receiver having a receiving circuit portion adopting a regenerative system and a forward-to-reverse switching control, said d.c. motor turning forward when no signal is received by said receiver and said d.c. motor turning in reverse when a signal is received by said receiver, said switching control comprising a pair of PNP transistors in a common-emitter configuration and a pair of NPN transistors in a common-emitter configuration, the collectors of the first and second of said PNP transistors being connected, respectively, to the collectors of the first and second of said pair of NPN transistors, whereby when no signal is received by said receiver, said first PNP transistor is turned off while said second PNP transistor is held on to apply bias to said first NPN transistor to hold the same on, thereby causing current to flow from said second PNP transistor to said first NPN transistor through said d.c. motor to continue forward rotation thereof, and when a signal is received by said receiver, said first PNP transistor is turned on causing the base bias of said second PNP transistor to equal about zero, turning the same off and applying bias to said second NPN transistor, thereby causing current to flow from said first PNP transistor to said second NPN transistor through said d.c. motor to cause reverse rotation thereof.

4,349,987

DOLL WHICH RISES FROM PRONE TO STANDING POSITION

Philip D. Bart, 9864 NW. 13th Ct., Coral Springs, Fla. 33065

Filed Jul. 17, 1980, Ser. No. 169,675
Int. Cl.[3] A63H *11/00*
U.S. Cl. 46—265 18 Claims

1. A robot doll comprising a torso with a hip part at the bottom thereof, and a 1st axis through said hip part, leg means mounted on said doll and pivotable about said 1st axis; drive means in the torso for causing said leg means and torso to pivot relative to each other, whereby

said doll is movable between positions of a series of positions including, with respect to a generally horizontal support surface, at least four positions, namely:

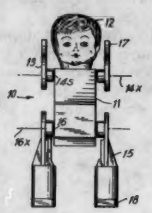
(A) prone face-down with leg means and torso generally aligned,

(B) face down with torso and leg means in inverted V-position with hip part elevated,

(C) said inverted V-position with said leg means oriented generally vertically, and

(D) erect position with said leg means and torso generally aligned and vertical, and

1st switch means for activating said drive means to pivot said leg means and torso causing said doll to move from position (A) to position (B), said doll having configuration and weight distribution such that when the doll moves from position (A) to (B) its center of gravity shifts rearward causing said doll to tip rearward into position (C), and



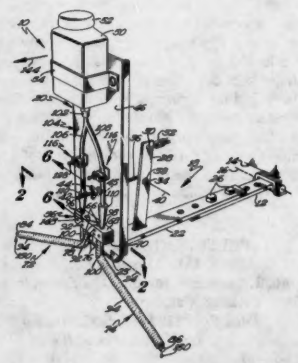
2nd switch means including means for automatically activating said drive means in response to the arrival of said doll at said position (C) to pivot said leg means and torso from pivoted position (C) to said erect position (D), whereby said doll stands.

4,349,988

HERBICIDE DISPENSING APPARATUS

Frank T. Kotula, 4058 Nevada Ave. North, New Hope, Minn. 55427, and Marvin E. Hilgemann, R.R. 4, Box 230, Pipestone, Minn. 56164

Filed Jun. 9, 1980, Ser. No. 157,358
Int. Cl.[3] A01M *21/00*
U.S. Cl. 47—1.5 5 Claims



1. A herbicide dispensing apparatus attachable to a movable vehicle for applying herbicide from a herbicide reservoir to unwanted plants which extend above crops planted in spaced-apart rows comprising:

a frame attachable to the vehicle for forward movement with the vehicle in a predetermined direction;

first and second herbicide applicator arms, each having an outer terminal end and means selectively swingably lockingly mounting each arm to said frame and said arms extending outwardly from said frame in leftward and rightward directions, respectively, generally transversely to the direction of forward movement and being slanted

downwardly from said frame to overlie and extend laterally to each side of a crop row during operation;

herbicide flow control means carried by said frame and connectable to the reservoir and extending to said first and second arms to deliver herbicide from the reservoir to each of said arms;

wicking means comprising a continuous rope type wick wrapped in closely adjacent helical coils along each of said arms to absorb the herbicide and wick the herbicide laterally along said arms and to apply such herbicide by physical contact to unwanted plants which contact said wicking means;

whereby said wicking means and said arms can be arranged to terminate between adjacent rows of crop so that any excess herbicide not applied to unwanted plants drips off only the terminal ends of said arms and falls harmlessly into the space between adjacent rows of crop so as to avoid impregnating the crops with herbicide.

4,349,989

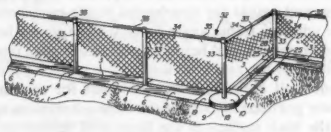
FENCE GUARD

H. Dean Snider, Jr., 9466 Pitch Pine Dr., Shreveport, La. 71118

Filed Mar. 23, 1981, Ser. No. 246,602

Int. Cl.³ E04H *17/06*

U.S. Cl. 47—33 **10 Claims**



1. A fence guard for retarding the growth of vegetation along a fence, comprising an elongated grass shield having a longitudinal slot along the center longitudinal axis thereof and provided with apertures in spaced relationship in said slot, said apertures corresponding to and in registration with the fence posts in said fence, said grass shield further comprising access slits provided in transverse relationship in said grass shield adjacent said apertures and communicating with said apertures for installation of said grass shield beneath said fence.

4,349,990

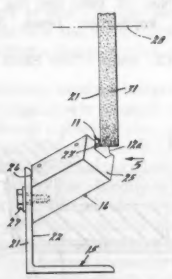
SUPPORT FOR GRINDING THREAD CUTTING TOOLS

Joseph F. St. Denis, 26545 Oakland, Roseville, Mich. 48066

Continuation of Ser. No. 120,906, Feb. 12, 1980, abandoned. This application Sep. 9, 1981, Ser. No. 300,702

Int. Cl.³ B24B *3/34*

U.S. Cl. 51—220 **2 Claims**



1. A tool support assembly for mounting a thread cutting tool having two cutting edges angularly related with respect to each other at the angle of the thread to be cut thereby and for positioning said tool relative to the periphery of a rotatably driven grinding wheel so that the cutting edges of said tool can be ground individually by separate grinding operations to sharpen said edges precisely at said thread angle and so that a desired relief for each cutting edge also can be ground in each grinding operation by a single angular adjustment of said support assembly, said assembly comprising:

support means having a flat mounting surface adapted to be disposed with said mounting surface transversely of and at right angles with respect to the rotational axis of the grinding wheel;

tool holding means having a flat seating surface on one end inclined with respect to the longitudinal axis of the holder at the same angle as said thread angle on and in engagement with said mounting surface;

connecting means including pivot means disposed with its axis at right angles to said mounting surface for releasably fastening said tool holding means on said support means with said mounting and seating surfaces in pressed mutual engagement, said tool holding means being angularly adjustable about said pivot means and said connecting means being operative to hold said tool holding means securely in any selected angularly adjusted position; and

tool clamping means for releasably holding the thread cutting tool securely on said tool holding means with one cutting edge of the tool parallel to the rotational axis of the wheel and exposed for grinding adjacent to the periphery of said grinding wheel and further with the longitudinal axis of the tool disposed with respect to said seating surface at the same angle as said thread angle,

whereby when said cutting tool is clamped on said tool holding means in the manner described said mounting and seating surfaces automatically position the tool with said one cutting edge thereof at right angles to said surfaces and parallel to the rotational axis of said grinding wheel and properly positioned with respect to the peripheral grinding surface of said wheel so that said one edge can be sharpened by a back and forth movement of said wheel along said rotational axis,

whereby repositioning of said tool on said tool holding means by turning it 180° about its axis automatically disposes the other cutting edge thereof similarly with respect to said grinding wheel for sharpening of said other edge, and whereby any desired relief angle can be ground behind each cutting edge of the tool during each grinding operation without removing said tool from or changing its position with respect to said tool holding means by a single adjustment of said tool holding means angularly about said pivot means.

4,349,991

CLOSING DEVICE FOR LARGE PASSAGES IN A PRESTRESSED PRESSURE VESSEL

Hans-Georg Schwiers, Ketsch, and Josef Schoening, Hambruecken, both of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany

Filed Feb. 28, 1980, Ser. No. 125,708

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1979, 2908969

Int. Cl.³ E04C *3/10*

U.S. Cl. 52—21 **9 Claims**

1. A closing arrangement for large passages in a prestressed pressure vessel comprising:

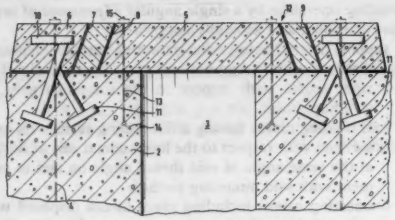
a cover means for covering the opening of a passage in said prestressed pressure vessel;

an annular structural part having an inner boundary surface surrounding said covering means at a distance and defining a space therebetween said part comprising concrete;

a means for securing said annular structural part to said prestressed pressure vessel, said securing means including a plurality of prestressing cables extending from said pressure vessel through said annular structural part and a

plurality of anchor members cast into said pressure vessel and annular structural part, and

a plurality of connecting elements disposed in said space



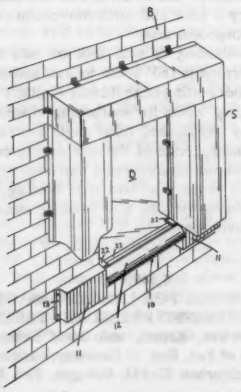
between said annular structural part and said covering means in abutting relationship with said inner boundary surface of said annular structural part and said covering means.

4,349,992

BUMPER SEAL

Richard C. Layne, 1312 King Ave., Apt. 4, Columbus, Ohio 43212

Filed Apr. 11, 1980, Ser. No. 139,230
Int. Cl.[3] E06B *7/22, 1/56*
U.S. Cl. 52—173 DS 4 Claims



1. A bumper seal for mounting along the lower edge of a loading dock for engaging a vehicle bumper, said bumper seal comprising:

(a) at least one bumper block formed of a relatively semi rigid, and relatively unyieldable material and positioned along the lower edge of a loading dock to engage and oppose the force applied by a vehicle bumper;

(b) a mounting strip mounted along said lower edge in alignment with said bumper block, said mounting strip formed with an upwardly opening slot for receipt of a dock plate lug and for retaining it against substantial movement upwardly or outwardly from said dock; and

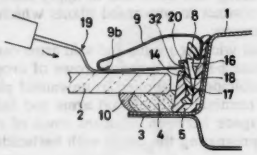
(c) a relatively yieldable and compressable sealing body mounted to said mounting strip and extending longitudinally along it for sealingly engaging said vehicle bumper.

4,349,993

MOLDING CLIP ASSEMBLAGE

Toshie Tanaka, Machida, and Takuo Yuda, Yokohama, both of Japan, assignors to Nifco Inc., Yokohama, Japan

Filed Jun. 10, 1980, Ser. No. 158,209
Int. Cl.[3] E06B *3/58*
U.S. Cl. 52—208 6 Claims



1. A molding clip assemblage for a molding member which is removable by a tool comprising:

a base plate attached to the peripheral edge of a window frame for the bonding of a glass plate thereto;

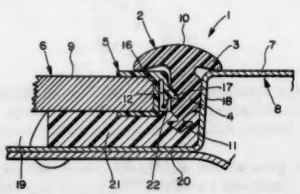
a plurality of removable clips attached to the base plate at predetermined intervals wherein the base plate is J-shaped in cross section and further comprises a rear wall of predetermined height for attachment to the peripheral edge of the window frame and a front wall of lower height than said predetermined height of said rear wall, a front surface portion of the rear wall and a back surface portion of the front wall defining a recessed part for accommodating lower portions of each of the clips wherein an upper part of the back surface of the front wall further comprises a claw, wherein each of said clips further comprise a retaining claw at an upper part thereof for retaining one edge of said molding member and a step extending therefrom at the lower part for engagement with the claw of the front wall of the base plate and wherein each of said clips further comprises release means extending upwardly from the step to protrude from the recessed part of the base plate for releasing engagement between the claw of the base plate and the step of each of the clips such that each of the clips are removable from the recessed part of the base plate by inserting said tool between the other edge of the molding and the upper surface of the glass plate and pushing the release means of each of said clips with said tool.

4,349,994

WEATHER STRIP ASSEMBLY FOR VEHICLE WINDOW

Tadashi Maekawa, Aichi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 19, 1980, Ser. No. 208,396
Claims priority, application Japan, Nov. 19, 1979, 54-160169[U]
Int. Cl.[3] B60R *27/00;* E06B *7/098*
U.S. Cl. 52—208 5 Claims



1. A weather strip assembly for a window of a vehicle, the window glass being positioned in an opening in the vehicle body so as to leave a gap between at least one edge of the window glass and a wall of the opening, and the window glass

being adhered at a portion of its inner surface to the vehicle body by a bonding agent, the bonding agent extending into the lower portion of the gap, the assembly comprising:

(a) a weather strip having a head portion, adapted to overlie a portion of an outer surface of the wall of said opening and a portion of the outer surface of said window glass, and a leg portion integrally formed with said head portion, provided with at least one lateral groove, and having an anchor-shaped lower end, said leg portion being adapted to be inserted in said gap, and said anchor-shaped end being adapted to be embedded in said bonding agent in the lower portion of said gap, and

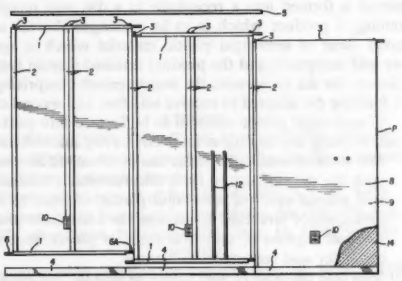
(b) a holder secured to said window glass and having a resilient elongation including a tongue disposed outwardly therefrom toward said groove in said leg portion, said tongue being adapted to engage said groove and said elongation being adapted for urging said leg portion against the wall of said opening when said weather strip is mounted on said vehicle.

4,349,995

INTERLOCKING PANEL AND PANEL TRACK SYSTEM

Danny E. Dowler, 512 Hawthorne St., and Herman F. Oldaker, 2701 18th Ave., both of Parkersburg, W. Va. 26101, assignors to Danny E. Dowler and Herman F. Oldaker, both of Parkersburg, W. Va.

Filed Feb. 4, 1980, Ser. No. 118,094
Int. Cl.³ E04B *2/74*; E04C *2/46*
U.S. Cl. 52—241 **12 Claims**



1. A wall panel assembly comprising:

a plurality of frames in abutting relationship wherein each of said frames comprises:

a plurality of upright members having first and second end portions;

a first and second connector plate member engaging said upright members at said first and second end portions, respectively, said first and second connector plate members each including a flange portion and a notched portion;

a plurality of projecting members integral with said upright members and cooperatively engaged with at least one of said first and second connector plate members;

a top connector flat bar member having a substantially rectangular cross section and having a length capable of overlapping at least two of said plurality of frames and cooperatively engaged with said plurality of projecting members and cooperatively engaged with at least one of said first and second connector plate members wherein said at least one of said first and second connector plate members and said top connector member each include a plurality of apertures formed therein and through which said plurality of projecting members are fitted such that said apertures in said at least one of said first and second connector plate members and said apertures in said top connector member are aligned by said plurality of projecting members; and

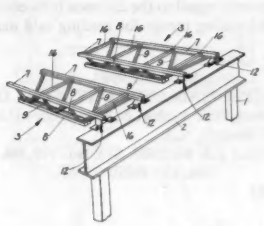
a track member within which at least one of said first and second connector plate members is disposed.

4,349,996

INTEGRATED ROOF SYSTEM

Richard W. Lautensleger, Middletown; Richard D. Shepard, Monroe, and Paul A. Seaburg, Middletown, all of Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Apr. 24, 1980, Ser. No. 143,261
Int. Cl.³ E04B *7/00*; E04C *3/04*
U.S. Cl. 52—655 **19 Claims**



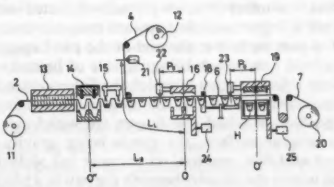
1. In a building of the type wherein the roof structure is supported on spaced apart rafters, an improved roof system comprising a series of V-trusses extending between the rafters in parallel relation at spaced apart intervals, said V-trusses each comprising a pair of half-truss sections each having a top chord and a bottom chord interconnected by web members, said truss sections being diagonally disposed with respect to each other with their bottom chords juxtaposed and secured together in face-to-face relation with their top chords spaced apart, tie members interconnecting the upper ends of said half-truss sections, seat members securing the opposite ends of the top chords of said V-trusses to said rafters, said seat members each comprising a pair of legs interconnected by an intermediate portion, feet on the lower ends of said legs, the intermediate portion of said seat member being secured to the top chord which it supports, and said feet being secured to the supporting rafter, said V-trusses being free from interconnecting braces, whereby said V-trusses comprise independent roof supporting members, and a roof structure supported on said V-trusses and secured to said top chords.

4,349,997

DEVICE FOR ENABLING REGISTRY OF OPERATIONS IN AN APPARATUS FOR CONTINUOUSLY FORMING CONTAINERS FILLED WITH MATERIAL

Yoshiyuki Hayasaka, Tsushima; Ichiro Ikeuchi, Kasugai; Hajime Matsumoto, Sagamihara, and Yukihiro Shikaya, Chiba, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Dainippon Printing Company Ltd., both of Tokyo, Japan

Filed Apr. 21, 1980, Ser. No. 141,888
Int. Cl.³ B65B *41/18*, *41/04*
U.S. Cl. 53—51 **4 Claims**



1. In a forming, filling and packing apparatus including a heating means for heating a bottom sheet of thermoplastic

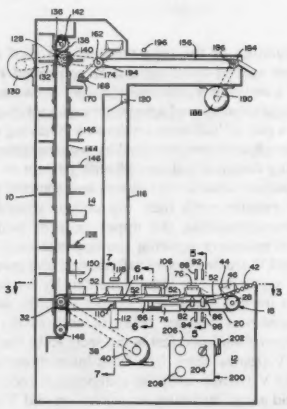
material fed intermittently, a forming means for forming successive container portions in said heated bottom sheet, a filling means for filling said container portions with material to be packed, a sealing means for sealing said container portions with a cover sheet having formed thereon reading marks and symbols corresponding to said container portions and fed intermittently together with said bottom sheet, said marks being formed with a spacing corresponding to the amount of intermittent movement of said bottom sheet and said cover sheet, and a carrying means for feeding intermittently said bottom sheet and said cover sheet, the improvement comprising reading means disposed in a position remote from said sealing means by a distance equal to the distance between said forming means and said sealing means for reading said marks.

4,349,998

CARTON INSPECTING AND CONVEYING APPARATUS

William J. Covert, Blue Anchor, N.J., assignor to Garvey Corporation, Blue Anchor, N.J.

Filed Jul. 16, 1980, Ser. No. 169,398
Int. Cl.³ B65B *57/02*
U.S. Cl. 53—53 **7 Claims**



1. A carton inspecting and conveying apparatus comprising

a continuously movable conveyor surface for transporting a series of cartons;

periodically actuated means for arresting the movement of the cartons at each of a plurality of locations along the conveyor;

means for sensing unsealed flaps on the cartons;

an ejector for selectively removing cartons from said conveyor surface at a location downstream of said sensing means; and

means responsive to said sensing means for actuating the ejector as a carton having an unsealed flap passes the ejector;

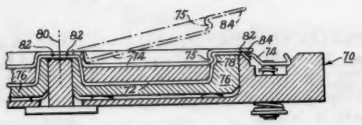
said carton arresting means including means defining a fixed channel, a plurality of pawls pivotally mounted within the channel, a finger extending upward from one end of each pawl, a cam surface at the end of the pawl opposite the finger, said pawls each being capable of limited rotation between a first position in which the fingers extend above the conveyor surface to arrest cartons thereon and a second position in which the fingers are withdrawn below the conveyor surface, the pawls being gravity biased toward said first position, an actuator bar slidably contained within the channel beneath the pawls, a plurality of shoulders on said actuator bar, one shoulder beneath each pawl for engaging a respective cam surface, and means for periodically displacing said actuator bar within said channel whereupon said shoulders engage said cam surfaces simultaneously to rotate said pawls to said second position to release cartons on the conveyor surface.

4,349,999

PACKAGING TECHNIQUES FOR SEMI-RIGID PACKAGES

Reid A. Mahaffy, Montclair, and Joel A. Hamilton, Englewood, both of N.J., assignors to Mahaffy & Harder Engineering Co., Totowa, N.J.

Division of Ser. No. 55,765, Jul. 9, 1979, which is a continuation of Ser. No. 913,822, Jun. 8, 1978, which is a division of Ser. No. 834,429, Sep. 19, 1977, Pat. No. 4,114,348, which is a continuation of Ser. No. 683,256, May 5, 1976, which is a division of Ser. No. 384,717, Aug. 1, 1973, Pat. No. 3,972,155, which is a division of Ser. No. 860,590, Sep. 24, 1969, Pat. No. 3,792,181. This application Mar. 27, 1981, Ser. No. 248,437
Int. Cl.³ B65B *47/10, 61/18*
U.S. Cl. 53—128 **5 Claims**



1. In an apparatus for making reclosable packages for food products and the like in which a first sheet of semi-rigid plastic material is formed into a receptacle in a die, said receptacle retaining a product which is to be packaged therein and a second sheet of semi-rigid plastic material which is applied over said receptacle and the product retained therein forming a closure for the receptacle, the improvement comprising:

a forming die adapted to receive said first and second sheets of semi-rigid plastic material to be formed into packages;

said forming die having at least one cavity into which said first sheet of semi-rigid plastic can be stretched to conform with the die surfaces to form said receptacle therein and said second sheet of semi-rigid plastic adapted to being subsequently stretched to engage the receptacle and the sidewall regions of said first sheet of plastic to form a cover for said receptacle so formed,

at least one sidewall of said cavity in said die having a surface irregularity located on an upper extremity thereof which will be above the level of the product which is to be packaged therein to form separable, mating, interengaged elements when said first and second sheets of plastic material are formed into said receptacle and said cover in said die,

said separable, mating interengaged elements providing a positive, interlocking closure for said package which may be opened by separating said interengaged elements and reclosed by the reengagement of said interengaged elements.

4,350,000

CROWNER NOISE SHIELD

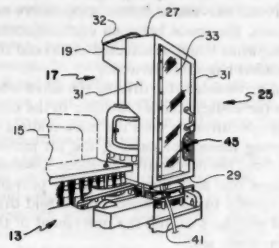
Leonard J. Schwemmer, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Mar. 13, 1981, Ser. No. 243,288
Int. Cl.³ B65B *7/28;* **G10K** *11/00*
U.S. Cl. 53—287 **7 Claims**

1. In a crowner machine including a face plate, chute and crown advancing means, said crown advancing means producing high levels of noise, the improvement comprising:

an acoustic enclosure for absorbing at least a portion of the noise produced by the crown advancing means, said acoustic enclosure including top, bottom, front, back and two side panels connected together, at least one of said panels having sound-absorbing material removably

mounted thereto, said back panel being formed with an opening to receive the face plate, chute and crown advancing means, said panels being adapted to engage the surface of said crowner machine, said acoustic enclosure being mounted to said crowner machine so that the face



plate, chute and crown advancing means are received within said opening in said back panel as said panels engage the surface of said crowner machine thereby entirely enclosing the face plate, chute and crown advancing means within said acoustic enclosure for maximum absorption of noise.

4,350,001

METHOD FOR TREATING INSULATING FIBER

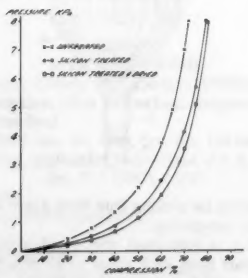
Roshan Shishoo, Askim, Sweden, assignor to Tex Innovation AB, Västra Frölunda, Sweden

Continuation-in-part of Ser. No. 53,008, Jun. 28, 1979, abandoned, which is a continuation of Ser. No. 728,374, Sep. 3, 1976, abandoned. This application Dec. 18, 1979, Ser. No. 105,049

Claims priority, application Sweden, Nov. 18, 1975, 7512944

Int. Cl.³ B65B *55/00*

U.S. Cl. 53—431 **13 Claims**



1. A method of packaging an inorganic fibrous product suitable for use as thermal or sound insulation, comprising the steps of treating the fibers of said product with a friction reducing agent, reducing the moisture content of the product, chilling or cooling the product, compressing the product to reduce its volume to at least 30% of its original volume and subsequently wrapping said product in a moisture-impermeable package.

4,350,002

PROCESS AND APPARATUS FOR PACKING INDIVIDUAL ARTICLES, IN PARTICULAR BOTTLES, ONE INTO EACH PACKAGE

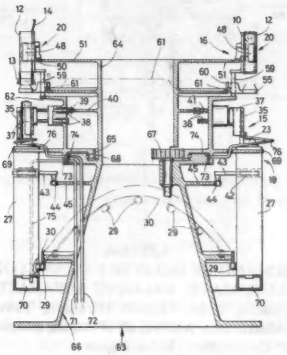
Heinz H. Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., Verden, Fed. Rep. of Germany

Filed May 1, 1980, Ser. No. 145,536

Claims priority, application Fed. Rep. of Germany, May 5, 1979, 2918139

Int. Cl.³ B65B *21/26, 39/14*

U.S. Cl. 53—449 **9 Claims**



1. A method for packaging individual objects, in particular bottles, into a package in which the objects to be packed are wrapped with an inner liner, comprising the steps of:

(a) moving the objects (**10**) to be packaged in an upright position along a first path (**15**) in a lower plane and moving packages (**12**) along a second path in an upper plane on a higher level than said lower plane;

(b) fitting said objects (**10**) into said inner liners (**11**) as said objects are moved along said first path and wrapping said objects (**10**) with said inner liners (**11**);

(c) lifting said objects (**10**) and the inner liners (**11**) in which said objects (**10**) are wrapped upwardly and inserting said objects (**10**) with their respective inner liners (**11**) into correspondingly positioned packages (**12**) through openings in the bottoms of said packages (**12**) as said objects (**10**) and said packages are moved along said first and second paths, respectively.

4,350,003

SEALING HEAD

Eddie L. Greenawalt; Steve C. Ray, both of Lake Jackson, and Daniels S. Garner, Richwood, all of Tex., assignors to Package Machinery Company, East Longmeadow, Mass.

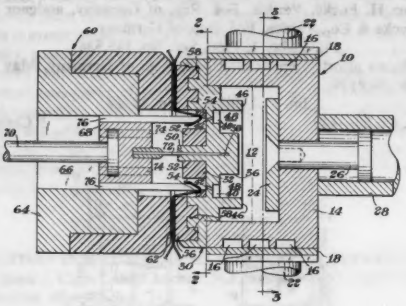
Filed Mar. 13, 1980, Ser. No. 129,968

Int. Cl.³ B65B *51/20*

U.S. Cl. 53—548 **3 Claims**

1. In a form, fill and seal machine having a gas sealing head of the general type comprising an elongated sealing face defining elongated slits communicating with a plenum for receiving pressurized gas to be emitted from said slits for forming bag end seals in producing form, fill and seal bags, the improvement which comprises, means associated with limited segments of the elongated slits and forming compartment means within said plenum by way of which pressurized gas is fed selectively from said plenum to the limited segments of the elongated slits, said compartment means defining valve seat means, a moveable valving means within said plenum and which is seatable with said valve seat means to at least partially block pressurized gas from flowing from said plenum through said compart-

ment means to the associated segments of the slits, whereby flow emitting from the slits is generally controllably channeled



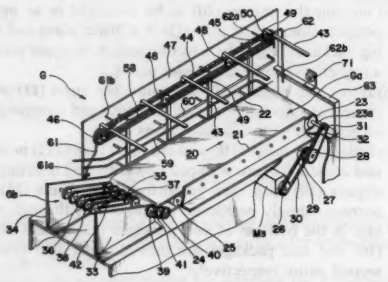
or uniform along the length of the slits depending on the valving position of said valving means.

4,350,004

MERCHANDISE DELIVERY CONVEYOR FOR AUTOMATIC BAGGING APPARATUS

Eiichi Tsujimoto, Kobe; Hiroshi Hirahara, Takarazuka, and Makoto Matsumoto, Ashiya, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Aug. 25, 1980, Ser. No. 181,223
Int. Cl.³ B65B *43/14*; B31B *1/76*
U.S. Cl. 53—570 **16 Claims**



1. For use with an automatic merchandise bagging apparatus for automatically loading articles to be bagged into a bag, said bagging apparatus comprising a bag erecting means for the support of bags supplied thereto one at a time, said erecting means being supported for pivotal movement between horizontal and erected positions and pivotable from the horizontal position towards the erected position to erect the bag with its mouth generally facing upwards after the articles have been loaded into the bag during the positioning of the erecting means at the horizontal position, a merchandise delivery conveyor apparatus which comprises, in combination:

a merchandise delivery conveyor unit including a main endless conveyor of a length sufficient to support a plurality of the loaded bags thereon in line with each other and having one end positioned adjacent the erected position of the bag erecting means;

a first drive means for intermittently driving the main endless conveyor in one direction required to transport the loaded bags successively in a direction away from the bag erecting means and towards the other end of the main endless conveyor;

a tilt preventing means including a plurality of tilt preventing arms, drive and driven wheel members rotatably supported respectively at positions laterally of and above the opposite ends of the main endless conveyor, and an endless carrier member drivingly turned around and extending between the drive and driven wheel members, said tilt preventing arms being connected at one end to the endless carrier member in equally spaced relation to each other for pivotal movement between operative and inoperative positions, the space between each adjacent two tilt preventing arms being so selected as to hold the corresponding loaded bag therebetween;

a second drive means for driving the drive wheel member to move the endless carrier member in the same direction as and in synchronism with the main endless conveyor;

a deflecting means for causing the tilt preventing arms to pivot from the inoperative positions towards the operative positions one at a time as said tilt preventing arms are successively turned around one of said drive and driven wheel members during the movement of the endless carrier member; and

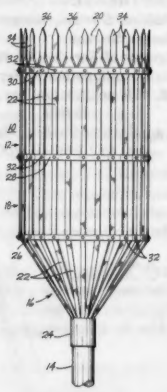
a folding means for causing the tilt preventing arms in the operative positions to pivot towards the inoperative positions one at a time as said tilt preventing arms are successively turned around the other of said drive and driven wheel members during the movement of the endless carrier member, whereby the loaded bag transferred from the bag erecting means onto the main endless conveyor and subsequently transported towards the other end of the main endless conveyor is positioned between every adjacent two tilt preventing arms in the operative positions one on each side of such loaded bag.

4,350,005

FRUIT PICKER

Thanh G. Tran, 5631 21st Ave. SW., Seattle, Wash. 98106

Filed Jul. 20, 1981, Ser. No. 285,266
Int. Cl.³ A01D *46/24*
U.S. Cl. 56—340 **4 Claims**



1. An apparatus for picking fruit from a tree while standing on the ground, comprising:

(a) a plurality of individual, thin, rigid, elongate members spaced apart from each other to form a fruit receiving receptacle, said members each including:

a substantially straight main portion to cooperatively form a tubular body section of said receptacle having an opening formed therein; and

a lower portion angularly disposed relative to its corresponding main portion to cooperatively form a bottom section of said receptacle;

(b) means for securing said members in spaced apart, fixed relationship to each other to cooperatively form the body and bottom sections of said receptacle;

(c) elongate pole means secured to the center of said receptacle bottom section;
(d) a plurality of substantially straight, elongate, spaced apart fingers projecting from said receptacle along the receptacle opening, each of said fingers:
associated with an individual receptacle member and forming a coplanar extension of said associated receptacle member; and
including a base portion at the intersection with said associated receptacle member, an elongate medial portion, and a pointed tip at the end of said finger opposite said base portion, said base portion having edges oriented angularly to said medial portion and intesecting an edge of an adjacent base portion;
(e) stationary, sharp blade means extending along the edges of said base portions of adjacent fingers; and
(f) wherein said apparatus is positionable to receive a stem of the fruit between adjacent fingers and then the stem is severed either by shifting the elongate handle longitudinally to cut the stem with said blade means or by rotating the elongate handle to twist and/or cut the stem with said fingers.

4,350,006
SYNTHETIC FILAMENTS AND THE LIKE

Miyoshi Okamoto; Koji Watanabe, both of Ohtsu; Yasuhiko Nukushina, Kyoto, and Tsuneo Aizawa, Ohtsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 613,604, Sep. 15, 1975, abandoned, which is a continuation of Ser. No. 43,101, Jun. 3, 1970, abandoned, which is a continuation of Ser. No. 607,302, Jan. 4, 1967, Pat. No. 3,531,368. This application Jul. 15, 1981, Ser. No. 283,382

Claims priority, application Japan, Jan. 7, 1966, 41-560; Nov. 18, 1966, 41-75446

Int. Cl.³ D02G *3/22, 3/36;* **D01D** *5/34*

U.S. Cl. 57—250 **88 Claims**

1. A bundle of ultrafine filaments composed of a fiber-forming polymer which is characterized in that said bundle comprises at least 10 substantially parallel ultrafine filaments each of which is continuous along the longitudinal axes of said bundle and has a denier of less than 0.1.

4,350,007
SPINNING FRAME

Hermann Gasser, Zürich; Karl Curiger, Pfäffikon, and Peter Novak, Winterthur, all of Switzerland, assignors to Luwa AG, Zürich, Switzerland

Filed Jun. 30, 1980, Ser. No. 164,066

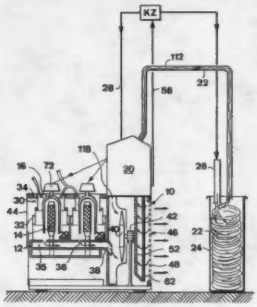
Claims priority, application Switzerland, Jul. 6, 1979, 6333/79

Int. Cl.³ D01H *11/00*

U.S. Cl. 57—304 **22 Claims**

1. A spinning frame comprising:
a spindle rail;
a plurality of spindles;
means defining a source of low pressure;
means defining a respective separate chamber for each spindle;
each said chamber being connected to a suction side of said source of low pressure by means of said spindle rail;
said chambers comprising generally circular sleeves which are variable in axial length;
each of said sleeves comprising a plurality of rings telescopically slidable within one another; and
a lowest ring of each said sleeve being sealingly connected to said spindle rail and including a vertically movable support to which an uppermost ring of each said sleeve is attached.

2. A spinning frame comprising:
a spindle rail;
a plurality of spindles supported by the spindle rail;
means defining a source of low pressure;
means defining a respective separate chamber for each spindle;



each said chamber being connected to a suction side of said source of low pressure by means of said spindle rail;
said chambers comprising generally circular sleeves which are variable in axial length;
a duct section having an orifice in said spindle rail provided for each said chamber; and
means connecting said duct sections to said source of low pressure.

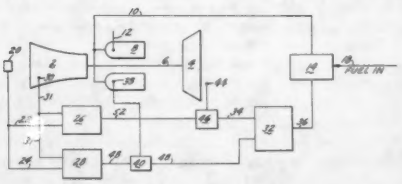
4,350,008
METHOD OF STARTING TURBINE ENGINES

Herbert C. Zickwolf, Jr., Bozrah, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 26, 1979, Ser. No. 107,461

Int. Cl.³ F02C *7/26*

U.S. Cl. 60—39.14 R **4 Claims**



1. A method of starting a turbine engine including the steps of:
cranking the engine until sufficient air flow is available for lightoff;
admitting fuel at a fixed flow rate to the engine; igniting the fuel; and then
increasing the rotor speed to operating speed by increasing the fuel flow at a rate of change that is a function of both rotor speed and ambient temperature.

4,350,009

COMBUSTION CHAMBER FOR A GAS TURBINE

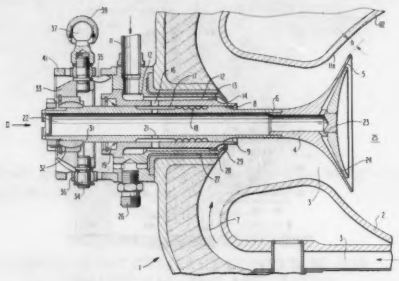
Immanuel Holzapfel, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 917,482, Jun. 21, 1978, abandoned. This application Oct. 2, 1980, Ser. No. 192,992

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1977, 2727795

Int. Cl.³ F02C *7/22, 9/00*

U.S. Cl. 60—39.23 **15 Claims**



1. A combustion chamber for a gas turbine, comprising:

ring-shaped atomizing nozzle means having swirl slot means for injecting a swirling mixture of fuel and air into a primary air flow,

pre-chamber means having a primary air in flow means,

combustion zone means having a primary air inlet means with a cross section,

deflection body means projecting through the inlet means of the combustion zone means and serving as flame holder means for the stabilizing of a combustion in a primary air zone means, and

means for changing the cross section of the primary air inlet means by a longitudinal movement of the deflection body means, said nozzle means causing the swirling mixture of fuel and air to enter the primary air inflow means as an annular jet disposed approximately concentrically around said flame holder means and to impinge approximately perpendicularly onto the primary air flow penetrating said primary air flow and uniformly mixing therewith.

4,350,010

EXHAUST SYSTEM FOR AN OUTBOARD ENGINE

Susumu Yukishima, Mamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha and Sanshin Kogyo Kabushiki Kaisha, both of Iwata, Japan

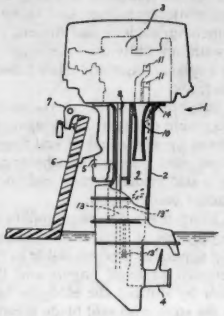
Filed Apr. 10, 1980, Ser. No. 138,939

Claims priority, application Japan, Apr. 17, 1979, 54-47379

Int. Cl.³ F01N *3/04;* F02B *27/04;* B63H *21/32*

U.S. Cl. 60—310 **9 Claims**

1. In an outboard engine assembly which includes a casing, an internal combustion engine having a water coolant circuit and an exhaust pipe, said casing enclosing an expansion chamber into which said exhaust pipe projects and into which it discharges engine exhaust gases, said exhaust pipe having an outlet end in said expansion chamber and a peripheral wall which is, for a substantial portion of its length immediately adjacent to its outlet end, exposed directly to said gases in said expansion chamber, at least part of the coolant water from said circuit being also discharged into said expansion chamber so as to contact at least part of said exposed portion of said exhaust pipe, the improvement comprising a plurality of pores extending through said peripheral wall near said outlet end of said exhaust pipe, whereby to permit flow of gases from said expansion chamber into and across said exhaust pipe, to discourage



backflow of said exhaust gases through said outlet end and into said exhaust pipe.

4,350,011

PUMPING APPARATUS FOR FLUID

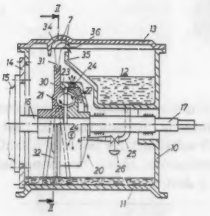
Thomas Rögner, Kirchberg, and Anton Frank, Oberspeltach, both of Fed. Rep. of Germany, assignors to Voith Turbo GmbH & Co. KG, Crailsheim, Fed. Rep. of Germany

Filed Apr. 29, 1980, Ser. No. 144,881

Claims priority, application Fed. Rep. of Germany, May 7, 1979, 2918284

Int. Cl.³ F16D *33/08*

U.S. Cl. 60—337 **26 Claims**



1. Pump apparatus for pumping a working fluid, in a hydrodynamic coupling, or the like, the pumping apparatus comprising:

a housing having a sump therein for the fluid; a container for the fluid, the container having an entrance into it which entrance is located above the level of fluid in the sump;

a spinnable disc in the housing, spinning in a plane which is substantially vertical; means for spinning the disc in the housing around a spin axis; the disc having a periphery; the disc being so shaped and the spin axis thereof being so placed that the disc periphery will dip into the liquid in the sump as the disc spins;

a stationary supply duct in the housing, the duct shaped and placed to enclose a portion of the periphery of the disc, starting from the bottom of the disc with respect to the housing and extending around the disc in the direction of

spin of the disc to an exit end of the duct; wherein the duct has a side thereof facing radially inwardly toward the disc, the duct being in spaced apart relation to the disc, and the side of the duct curving toward the disc at an exit of the duct, whereby the duct is shaped and placed for directing fluid, which would otherwise be thrown clear of the disc back toward the periphery of the disc, at least at the exit end of the duct;

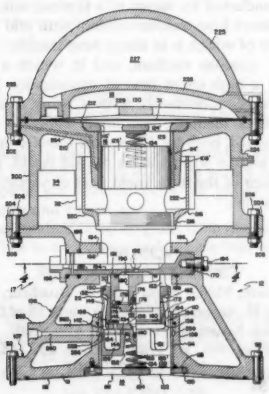
the disc including fluid carrying means at the periphery thereof for carrying fluid up beyond the exit from the duct for throwing upwardly the fluid carried by the fluid carrying means and for flinging the fluid to enter the container through the entrance thereof.

4,350,012

DIAPHRAGM COUPLING BETWEEN THE DISPLACER AND POWER PISTON

Lawrence R. Folsom, Schenectady, N.Y., and John J. Dineen, Durham, N.H., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jul. 14, 1980, Ser. No. 168,075
Int. Cl.³ F02G *1/04*
U.S. Cl. 60—520 **21 Claims**



1. A free-piston Stirling engine having a sealed vessel defining therein a working space; a displacer axially movable in the working space for shuttling working gas between one end of the working space where it is heated, and the other end of the working space where it is cooled; a power piston axially movable in said vessel having a power stroke under the influence of the expansion of said working gas at a high temperature, and a compression stroke in which it compresses said working gas at a low temperature; wherein improvements comprise:

means for hermetically separating one end of said power piston from said working space;

said power piston having a second end;

a bounce space connected to said working space by connection means that allows flow of working gas only fast enough to equalize the mean gas pressure;

said power piston second end being in power transfer relation to said bounce space;

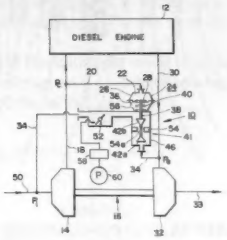
means for hermetically separating said second end of said power piston from, and for sealing said bounce space.

4,350,013

EXHAUST GAS RECIRCULATION SYSTEM

Yasutaka Yoshiba, Chiba, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 29, 1980, Ser. No. 116,641
Claims priority, application Japan, Feb. 9, 1979, 54-15492[U]
Int. Cl.³ F02B *37/00*; F02M *25/06*
U.S. Cl. 60—605 **5 Claims**



1. In a diesel engine having a turbocharger which includes a compressor for supplying compressed air to the engine, and which includes a turbine driven by exhaust gas from the engine for rotating the compressor, an exhaust gas recirculation system comprising:

a recirculation passage connecting the exhaust side of the engine and the intake side of the compressor for carrying the exhaust gas from the engine to the compressor;

a control valve disposed within said recirculation passage; and

valve actuating means associated with said valve for sensing compressor output pressure and for causing said control valve to close said recirculation passage when the sensed compressor output pressure is lower than a first predetermined value, and when the sensed compressor output pressure is higher than a second predetermined value, the second predetermined value being higher than the first predetermined value.

4,350,014

PLATFORM FOR UTILIZATION OF THE THERMAL ENERGY OF THE SEA

Pierre Sanchez, Cesson, and Andre Vitalis, Paris, both of France, assignors to Societe Anonyme dite: Sea Tank Co., Rungis, France

Filed Nov. 26, 1979, Ser. No. 97,285
Claims priority, application France, Nov. 30, 1978, 78 33888; Jan. 25, 1979, 79 01971; Oct. 8, 1979, 79 24975
Int. Cl.³ F03G *7/04*
U.S. Cl. 60—641.7 **40 Claims**

1. A platform for utilization of the thermal energy of the sea, said platform comprising:

a floating structure carrying a downwardly extending tube for taking up cold water,

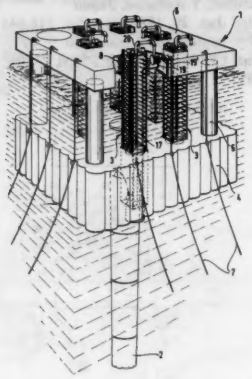
at least two power modules supported on said floating structure,

each power module comprising an evaporator and a condenser and pumps for circulation of hot and cold water,

each power module being connected to a turbine-driven generator set,

the improvement wherein the support structure has open upright cells receiving said power modules, and wherein each module has its component parts arranged in a vertical array so as to constitute a cylindrical assembly extending through the support structure cell, and wherein the

support structure is semi-submersible and comprises a cellular concrete base surmounted by columns supporting



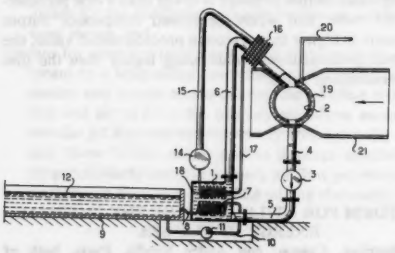
a working deck, and each module passes through said base and said working deck.

4,350,015

MACHINE FOR CONVERTING THERMAL ENERGY INTO WORK

Herve d'Achon, Domaine de Bagari, 83120 Ste Maxime S/Mer, France

Filed Sep. 24, 1980, Ser. No. 190,260
Claims priority, application France, Sep. 26, 1979, 79 23914
Int. Cl.³ F03G 7/00; F01K 9/00
U.S. Cl. 60—675 **8 Claims**



1. A closed circuit machine for converting thermal energy into work and having a heating fluid circulating therethrough, said heating fluid comprising a source of heat, said machine comprising:

(a) a tank adapted to hold liquid and traversed by a first coil for circulating said heating fluid, said coil having two ends, both of said ends being connected to a basin, said basin adapted to be partly filled with water;

(b) a condenser positioned above said tank, said condenser comprising a cold source capable of evacuating heat from said tank via a thermally insulated pipe connecting said tank and said condenser and having a low prssure therein;

(c) a hydraulic motor positioned in the lower portion of a return pipe system connected to said condenser and said tank;

(d) a Venturi tube positioned about said condenser; and

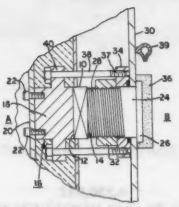
(e) a spongy material coated about said condenser and means for humidifying said spongy material, wherby when said closed circuit is filled with fluid, heat is generated within said tank and gaseous fluid rises under low pressure to said condenser, condenses into liquid therein and descends as liquid to actuate said hydraulic motor.

4,350,016

DEVICE AND PROCESS FOR EFFECTING REFRIGERATION

Shlomo Beitner, Tel-Aviv, Israel, assignor to Bipol Ltd., Tel-Aviv, Israel

Filed Feb. 20, 1981, Ser. No. 236,523
Int. Cl.³ F25B 21/02
U.S. Cl. 62—3 **10 Claims**



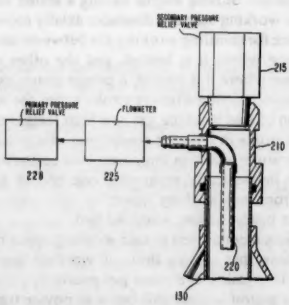
1. In a device enveloped by an ambient, gaseous medium, a process for effecting refrigeration therein by means of a thermoelectric element having a hot face and a cold face activated by imposing a direct current potential across said faces, wherein said hot face is cooled by conducting heat therefrom into said ambient, gaseous medium, the improvement in which the heat is conducted by means of a thermal sink, one face of which is in direct heat-transfer contact with said hot face and the other face of which is in direct heat-transfer contact with said ambient, gaseous medium, and in which a vaporizable liquid having a high latent heat of vaporization is applied to said other face concomitantly with it being exposed to said ambient, gaseous medium, said liquid being so applied that cooling is effected, both by direct heat transfer into said gaseous medium and by vaporization of said liquid, whereby advantage is taken of the high latent heat of vaporization of the vaporizable liquid.

4,350,017

CRYOSTAT STRUCTURE

George D. Kneip, Menlo Park; John H. Broshear, East Alviso, and Marvin H. Anderson, Mountain View, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 10, 1980, Ser. No. 205,118
Int. Cl.³ F17C 7/02
U.S. Cl. 62—50 **10 Claims**



1. A cryostat comprising an inner reservoir for containing a cryogenic liquid, and outer shells surrounding said reservoir, a

fill and vent tube communicating from said inner reservoir through said outer shell and a cylindrical baffle disposed interiorly of said fill and vent tube, said cylindrical baffle comprising another tube having an outer diameter substantially smaller than the inner diameter of said fill and vent tube, said interior of said another tube adapted to communicate with the exterior of said outer shell through a low pressure relief valve, and the annular conduit space formed between the exterior of said another tube and the interior of said fill and vent tube adapted to communicate with the exterior of said outer shell through a relatively high pressure relief valve.

4,350,018
GAS RECOVERY SYSTEM

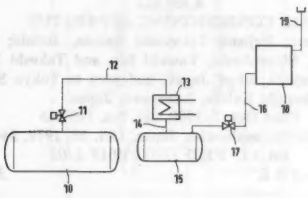
Karl Frank, Linz, and Ewald Marnette, Windhagen, both of Fed. Rep. of Germany, assignors to Kohlensäure-Werke Rud. Buse GmbH & Co., Bad Hönningen, Fed. Rep. of Germany

Filed Mar. 20, 1981, Ser. No. 245,934

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1980, 3011300; Japan, Jan. 29, 1981, 3102966

Int. Cl.³ F17C *13/00*

U.S. Cl. 62—54 **13 Claims**



1. A method of recovering the gases originating from a storage tank during abnormal operation thereof, the method comprising

passing the escaping gases to a heat exchanger where they are cooled and liquified by heat exchange with a liquified, low-boiling coolant gas selected from the group consisting of CO_2, nitrogen and Freon, and

conveying the liquified escaping gases from the heat exchanger through a line to a collector tank where they can be stored.

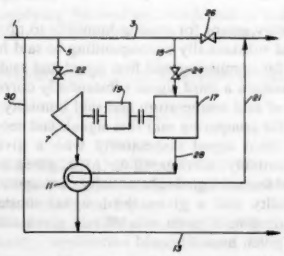
4,350,019
GAS EXPANSION/COMPRESSION TRAIN

William Chocas, Memphis, Tenn., assignor to W. R. Grace & Co., New York, N.Y.

Filed Dec. 22, 1980, Ser. No. 218,760

Int. Cl.³ F25D *7/00*

U.S. Cl. 62—87 **5 Claims**



1. The method of forming an initial gas stream at a pressure above atmospheric pressure which is to be used as both a fuel gas and as a feedstock stream for a chemical process into a first fuel stream of lower pressure and a second feedstock stream of higher pressure, comprising

(1) dividing the initial stream into a first fuel stream and a second feedstock stream;

(2) charging the first stream to an expander turbine coupled to a compressor and recovering this first stream as a fuel stream at lower pressure; and

(3) compressing the second stream with the compressor and recovering this second stream as a feedstock stream for a chemical process at higher pressure than the pressure of the initial gas,

whereby a portion of the initial gas being used as a feedstock stream for a chemical process is converted to a higher pressure than the pressure of the initial gas.

4,350,020
PROCESS FOR PRODUCING HEAT BY MEANS OF A HEAT PUMP OPERATED WITH A FLUID MIXTURE AS WORKING AGENT AND AIR AS HEAT SOURCE

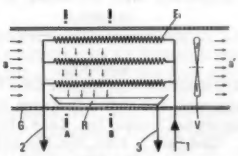
Alexandre Rojey, Garches, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jan. 23, 1981, Ser. No. 227,844

Claims priority, application France, Jan. 24, 1980, 80 1575

Int. Cl.³ F17D *17/06*

U.S. Cl. 62—93 **13 Claims**



1. In a process for producing heat by means of a heat pump comprising the steps of (a) vaporizing a working fluid, in an evaporation zone, in counter-current thermal exchange contact with a first fluid used as a heat source, under a first pressure level, said working fluid consisting essentially of a non-azeotropic mixture of at least two distinct components, (b) compressing the resultant vaporized working fluid, (c) condensing the resultant compressed vaporized working fluid, in a condensation zone, in counter-current thermal exchange contact with a second fluid for heating said second fluid, under a second pressure level higher than the first pressure level, and (d) expanding the condensed working fluid from step (c) and recirculating it to step (a), the improvement comprising:

conducting said vaporization of the working fluid in counter-current thermal exchange contact with a first fluid comprising relatively cool moist air by passing the working fluid through an evaporator zone with the cool moist air being passed successively through a first section of the evaporator zone which is nearest the point of entry of the relatively cool moist air into the evaporator zone, and a second section of the evaporator zone which is nearest the point of exit of the relatively cool moist air, thereby causing water to be condensed and deposited on the surfaces of the first section of the evaporator zone and frost to form on the surfaces of the second section of the evaporator zone; and

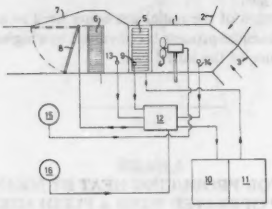
discharging the deposited water from the first section immediately upon condensation thereof to prevent said condensed water from contacting the surfaces of the second section, thereby reducing the amount of frost formed on the surfaces of the second section.

4,350,021

DEVICE FOR PREVENTING ICING IN AN AIR CONDITIONING UNIT FOR MOTOR VEHICLES

Gustaf B. Lundström, Gothenburg, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Nov. 4, 1980, Ser. No. 204,080
Claims priority, application Sweden, Nov. 12, 1979, 7909329
Int. Cl.³ F25D *21/00*
U.S. Cl. 62—150 **6 Claims**



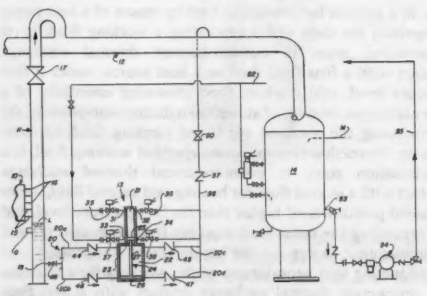
1. A device for preventing icing in a thermostat-controlled evaporator in an air conditioning unit for motor vehicles, comprising a first sensor for sensing the speed of the air flowing through the evaporator, and control means which cooperates with the sensor and the thermostat to receive information on the air speed and to send a control order dependent thereon to the thermostat to reduce the lower limit for permissible evaporator temperatur with increasing air speed, and vice versa.

4,350,022

REFRIGERANT TRANSFER SYSTEM

Paul J. Kristapovich, and Milton E. Knapp, both of Lake Mills, Wis., assignors to Crepaco, Inc., Lake Mills, Wis.

Filed Oct. 2, 1980, Ser. No. 193,168
Int. Cl.³ F25B *41/00*
U.S. Cl. 62—174 **8 Claims**



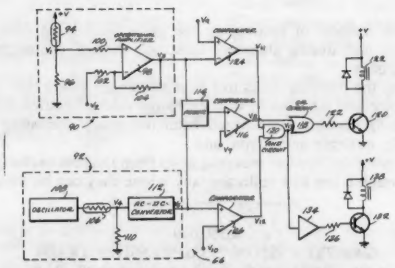
1. In a refrigeration system utilizing a pumped liquid refrigerant, a combination comprising a substantially upright suction header having a first connection to an evaporator unit; a suction main elevated relative to said header and connected to an upper end portion thereof; a pump for liquid refrigerant including a pair of elongated chambers arranged in substantially end-to-end relation and separated from one another by a common partition, one chamber having a substantially smaller cross-sectional area than the second chamber, each chamber having the opposite ends thereof provided with port means, and piston means reciprocally mounted within said chambers, said piston means having a first head slidably disposed within said one chamber and a second head slidably disposed within said second chamber, said second head having a substantially greater diameter than said first head, said heads being interconnected by means extending through said common partition whereby said heads are movable as a unit; first sets of inlet and outlet valve means connected to the port means at each end of said one chamber, each inlet valve means communicating with a source of high pressure fluid; control means operatively connected to said first sets of valve means wherein alternately an inlet valve means at one end of said one chamber and an outlet valve means at the opposite end of said one chamber open and close simultaneously; a second set of inlet and outlet valve means connected to the port means at each end of the second chamber, each inlet valve means of the second set communicating with a second connection provided in said header and spaced beneath said first connection whereby liquid refrigerant accumulated in said header is adapted to flow only in one direction through one inlet valve means of the second set into a portion of the second chamber disposed to one side of the piston means second head and simultaneously flow outwardly from the other portion of the second chamber disposed to the opposite side of the piston means second head for each stroke of the latter within the second chamber, each outlet valve of the second set communicating with said suction main and permitting liquid refrigerant flow in only one direction from said second chamber to said suction main.

4,350,023

AIR CONDITIONING APPARATUS

Eiji Kuwabara, Fujishi; Takayoshi Sakata, Jufishi; Noboru Kawauchi, Shizuokashi; Yuuichi Ide, and Takeshi Matsuo, both of Fujishi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Oct. 7, 1980, Ser. No. 195,065
Claims priority, application Japan, Oct. 15, 1979, 54-132673
Int. Cl.³ F25D *17/00*; B01F *3/02*
U.S. Cl. 62—176 E **3 Claims**



1. An operational mode controller for an air-conditioning apparatus for controlling the temperature and the humidity comprising:

a temperature sensor for sensing temperature to produce a first signal substantially corresponding to said temperature;

a humidity sensor for sensing humidity to produce a second signal substantially corresponding to said humidity;

means for combining said first signal and said second signal to produce a third signal substantially corresponding to a sum of said temperature and said humidity;

means for comparing said first signal, said second signal and said third signal respectively with a given first signal substantially corresponding to a given temperature, a given second signal substantially corresponding to a given humidity and a given third signal substantially corresponding to a given sum of said given temperature and said given humidity; and

an actuating means responsive to said comparing means for actuating said air conditioning apparatus for controlling the temperature when said temperature and said humidity exceed said given temperature and said given humidity while said sum exceeds said given sum, for controlling the

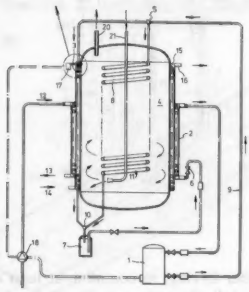
humidity when said humidity exceeds said given humidity while said temperature is below said given temperature and for stopping control of both the temperature and the humidity when both said temperature and said humidity are below said given temperature and said given humidity while said sum is below given sum.

4,350,024

HEATING SYSTEM

Thorleif Möll, Fjäras, Sweden, assignor to Cinderella AB, Sweden

Filed Oct. 15, 1980, Ser. No. 197,329
Claims priority, application Norway, Oct. 15, 1979, 793312
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—238.6 **9 Claims**



1. A heating system for heating first and second fluids, comprising:

compressor means for heating a heat exchange medium, such as Freon, to a gas;

means for supplying the medium from said compressor means to first and second, parallel pipe coils;

valve means for controlling amounts of said medium supplied to said first and second pipe coils;

a tank for storing said first fluid to be heated;

said first pipe coil in said tank being submerged in said first fluid;

said second pipe coil external to and in thermal contact with said tank;

means for supplying said second fluid into thermal contact with said second pipe coil;

evaporator means external to and in proximity with said second pipe coil;

means for supplying the medium, condensed in said first and second pipe coils, to said evaporator means for evaporation; and

means for returning the evaporated medium to said compressor.

4,350,025

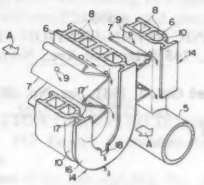
REFRIGERANT EVAPORATOR

Masao Izumi, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 6, 1981, Ser. No. 251,100
Claims priority, application Japan, Apr. 18, 1980, 55-51766[U]
Int. Cl.³ F25D *21/14*
U.S. Cl. 62—285 **8 Claims**

1. A refrigerant evaporator for use with air-flow inducing means operative to establish a flow of air in a predetermined direction through the evaporator so that the evaporator has windward and leeward ends in said direction, comprising:

an evaporator tube having a longitudinal direction substantially at right angles to said predetermined direction and a serpentine-anfractuous cross section in said longitudinal direction, the evaporator tube having a plurality of parallel portions spaced apart from each other in said longitudinal direction and having formed therebetween gaps



through which said flow of air is to pass in said predetermined direction, and

a plurality of fins each secured to and intervening between neighboring two of said parallel portions,

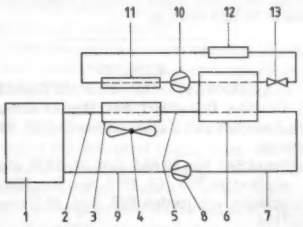
said evaporator tube having at the leeward end of the evaporator an end wall and a ridge wall projecting in a leeward direction from said end wall and forming along the end wall a pair of grooves which are opposite to each other across ridge wall.

4,350,026

COOLING DEVICE FOR ELECTRICAL AND/OR ELECTRONIC COMPONENT ELEMENTS PRODUCING LOST HEAT AND A PROCEDURE FOR OPERATING SUCH

Erwin Klein, Heddesheim, Fed. Rep. of Germany, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

PCT No. PCT/CH79/00078, § 371 Date Apr. 28, 1980, § 102(e) Date Apr. 28, 1980, PCT Pub. No. WO80/00511, PCT Pub. Date Mar. 20, 1980
PCT Filed May 25, 1979, Ser. No. 199,461
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1978, 2837353
Int. Cl.³ F25D *17/00*; H01L *23/44*
U.S. Cl. 62—333 **2 Claims**



1. A cooling system for cooling at least one semiconductor component, comprising:

a coolant flow circuit connected with said component

a convection heat exchanger connected in said circuit;

a refrigeration cycle system thermally coupled to said coolant circuit and including a compressor, a condenser, a collector, an expansion valve, and an evaporator, said evaporator coupled in series with said exchanger in said circuit;

at least one fan for forcibly ventilating said convection heat exchanger for thereby cooling the at least one semiconductor component;

said condenser of said refrigeration cycle system installed in said forcibly ventilated convection heat exchanger whereby said at least one fan serves also to cool said condenser; and

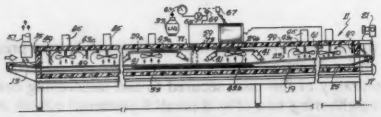
a coolant suitable for combined convection and boiling cooling being used in the coolant circiut, said coolant having a boiling point below the wall temperature of said at least one semiconductor component to be cooled.

4,350,027

CRYOGENIC REFRIGERATION APPARATUS

Lewis Tyree, Jr., 145 Briarwood Ave., North, Oak Brook, Ill. 60521

Filed Oct. 5, 1981, Ser. No. 308,373
Int. Cl.³ F25D *17/02*
U.S. Cl. 62—374 **10 Claims**



1. Refrigeration apparatus for utilizing a cryogenic liquid, such as liquid nitrogen, to cool material which is moved therethrough, which apparatus comprises:

means defining an elongated insulated enclosure,

means for conveying material to be cooled through said enclosure from an entry end to an exit end thereof,

cryogen injection devices located above said conveying means for expanding cryogen under superatmospheric pressure to substantially atmospheric pressure, which include spray nozzle means and a major portion of which include inducer means located in surrounding relationship to said spray nozzle means,

said devices being arranged in a first array with a first group of nozzle means being directed downward and toward said entrance end and with a second group of nozzle means being directed downward and toward said exit end, said first and second groups being spaced longitudinally apart to provide an intermediate region therebetween,

fan means located between said first and second groups for creating an upward flow of cryogen vapor in said intermediate region and

means for supplying liquid cryogen under superatmopheric pressure to said devices.

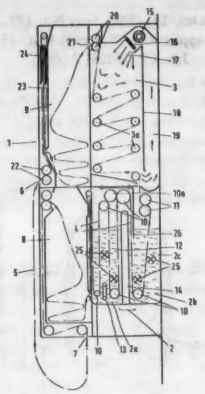
4,350,028

AUTOMATIC TOWEL DISPENSER

Hugo W. Geschka, Düsseldorf, Fed. Rep. of Germany, assignor to LUK Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation of Ser. No. 50,641, Jun. 21, 1979, abandoned. This application Nov. 13, 1980, Ser. No. 206,622
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1978, 2827184
Int. Cl.³ A47K *10/30*
U.S. Cl. 68—13 R **2 Claims**

1. In an automatic towel dispenser having a housing containing a washing and a drying chamber for an endless towel passable therethrough, a delivery slot and an inlet slot formed in the housing, the towel having a cleaned section available for use extending outside the housing between the delivery slot and the inlet slot, respectively, means defining a path from the inlet slot to the washing chamber and from the drying chamber to the delivery slot along which the endless towel is movable, the housing also containing a first supply chamber for variably stacking a plurality of soiled towel sections of the endless towel therein, the first supply chamber being located between the inlet slot and the washing chamber, as viewed in travel direction of the towel, and the housing further containing a second supply chamber for variably stacking a plurality of cleaned towel sections of the endless towel therein, the second supply chamber being located between the drying chamber and the delivery slot, as viewed in travel direction of the towel, the path extending through the washing and drying chambers and into the second supply chamber for cleaned towel sections, means for passing the soiled towel sections, after a given quantity of the cleaned towel sections have been emptied, through the washing and drying chambers, while washing and drying processes are set into operation, and for depositing the sections in the second supply chamber for cleaned towel sections, the



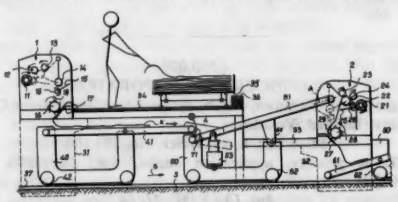
washing chamber having, in common, at least one wash tub and one rinsing tub, the path extending through the wash tub and the rinsing tub, and means for passing the endless towel in a looping manner through the wash tub and the rinsing tub along the path therethrough, the improvement therein comprising a steam or vapor barrier located between the wash tub and the rinsing tub, said barrier comprising a covering formed of material having high thermal conductivity and being located in the common washing chamber between the wash tub and the rinsing tub, said covering overlapping an upper region of the wash tub and being immersed below rinsing liquid level in the rinsing tub.

4,350,029

APPARATUS FOR DE-FLESHING SKINS OR HIDES

Ladislav Janirek, Gottwaldov; Jaroslav Hlavinka, Kromeriz; Josef Hanacek, and Zdenek Miculka, both of Otrokovice, all of Czechoslovakia, assignors to Strojosvit, Krnov, Czechoslovakia

Filed Dec. 3, 1980, Ser. No. 212,355
Claims priority, application Czechoslovakia, Dec. 7, 1979, 8538-79
Int. Cl.³ C14B *1/00*
U.S. Cl. 69—1 **4 Claims**



1. A system for de-fleshing skins or hides, comprising two de-fleshing stations, each having a supporting roller for receiv-

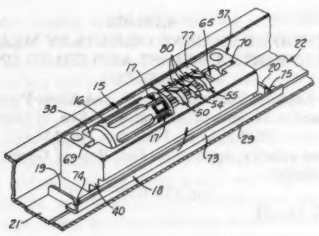
ing and carrying said hide past knife means for de-fleshing the skin and to an outlet chute, said stations being interconnected by a transfer bridge, the first de-fleshing station being attached through its outlet chute to the rear end of the transfer bridge while the second de-fleshing station is attached through its outlet chute to the rear end of a carry away conveyor said transfer bridge comprising a pair of conveyors, the first of which is set so that its front end extends over the rear end of the second conveyor, said second conveyor being provided with a means for swinging the front end thereof in a vertical plane to assure a selected fixed condition between a position above the supporting roller of the second de-fleshing station and a position above the rear end of carry-away conveyor.

4,350,030

LUGGAGE CASE RESETTABLE SEQUENTIAL COMBINATION LOCK

Robert L. Bromley, Aurora, Colo., assignor to Samsonite Corporation, Denver, Colo.

Filed Oct. 27, 1980, Ser. No. 201,026
Int. Cl.³ E05B *37/08*
U.S. Cl. 70—70 **6 Claims**



1. A combination lock, comprising:

a housing including a cavity in one side and first and second openings in another side thereof in communication with said cavity;

a shaft mounted in the housing cavity;

a numbered wheel rotatably mounted on said shaft;

drive hub means rotatably mounted on said shaft and having a first end interconnected with the numbered wheel for rotation therewith, a cylindrical hub extending away from the numbered wheel, tooth means arranged about the cylindrical hub and spaced inwardly from a second end of said hub means, and a protrusion on said second end;

first and second lock hubs each including a generally cylindrical body having an axial opening therethrough, a protrusion on a first end of the cylindrical body, a recess of larger dimensions than the diameter of the cylindrical body formed in second end of said cylindrical body, a set of teeth arranged about the cylindrical body facing the first end and a radially extending tooth located on the wall defining the recess periphery;

first, second, and third discs, each having a central bore, a set of teeth surrounding said bore adapted to mesh with the teeth on said lock hubs and drive hub means, and a flattened peripheral edge portion;

said first disc being located on the shaft and received on the drive hub means cylindrical hub with the first disc teeth meshing with the teeth on said drive hub means, the first lock hub being located on the shaft with its recess receiving the protrusion of said drive hub means therein, the second disc being received on both the shaft and the cylindrical hub of said first lock hub with the second disc teeth meshing with the teeth of said first lock hub, the second lock hub being located on the shaft with its recess receiving the protrusion of the first lock hub therein, and the third disc being received on the shaft and cylindrical hub of the second lock hub with the teeth of each meshing together;

peripheral circular edge portions of the first, second and third discs extending outwardly of the housing through said housing first opening, the flattened peripheral edge portions remaining with the housing at all rotative positions of said discs;

plate means having an edge pivotally related to the housing and extending over the housing first opening; and

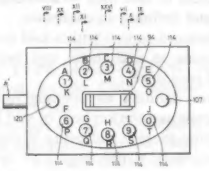
spring means resiliently holding said plate means on said housing.

4,350,031

PUSHBUTTON OPERATED DOOR LOCKS

Junichi Shimono, 913 Enjoji, Kasamatsu-cho, Hashima-gun, Gifu-ken, Japan

Continuation-in-part of Ser. No. 750,563, Dec. 14, 1976, Pat. No. 4,070,881. This application Jul. 5, 1977, Ser. No. 813,224
The portion of the term of this patent subsequent to Jan. 31, 1995, has been disclaimed.
Int. Cl.³ E05B *37/02, 37/16*
U.S. Cl. 70—315 **6 Claims**



1. A pushbutton operated door lock comprising:

a casing having front and rear faces;

a lock shaft in said casing;

a lock bolt slidably carried by said lock shaft and having a multiplicity of notches juxtaposed along the length of said lock bolt;

a multiplicity of tumbler rings rotatably supported on said lock shaft and juxtaposed along the length thereof, each of said tumbler rings having an outer peripheral edge formed with a plurality of lateral bores;

a plurality of engage pins each received in one of said lateral bores of each of said tumbler rings and movable in and out relative to said one lateral bore for restricting an angle of rotation of said each tumbler ring;

a multiplicity of first pushbuttons on said front face of said casing adapted for individual engagement with said tumbler rings to rotate said tumbler rings individually;

a second pushbutton on said front face of said casing adapted for simultaneous engagement with all of said tumbler rings to rotate said tumbler rings simultaneously;

a pair of third pushbuttons on said rear face of said casing adapted for simultaneous engagement with all of said tumbler rings to rotate said tumbler rings simultaneously;

said first pushbuttons being associated with said second and third pushbuttons to permit a number of said tumbler rings to selectively engage with and disengage from said notches upon rotation of said tumbler rings;

a first guide rod and a second guide rod for guiding said engage pins for said in and out movement thereof; and

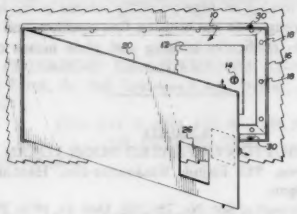
said rear face of said casing being formed therethrough with a multiplicity of guiding apertures for insertion of said guide rods, whereby the angle of rotation of said tumbler rings may be controlled for selectively changing the function of said first pushbuttons.

4,350,032

VENDING MACHINE LOCK SECURITY COVER

Donald G. Kochackis, E. Prospect St., Chula Vista, Calif. 92011

Filed Aug. 25, 1980, Ser. No. 181,075
Int. Cl.³ E05B *17/18*
U.S. Cl. 70—427 7 Claims



1. A security cover for the lock of a vending machine or the like comprising:

(a) a frame and means mounting same over said lock;

(b) a closure moveably mounted on said frame and being moveable thereon from an open position providing substantial access to said lock to a closed position covering said lock and defining an enclosure;

(c) locking means disposed within said enclosure for locking said enclosure to said frame and being operative from inside said enclosure;

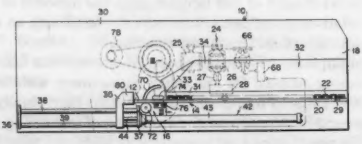
(d) said cover defining an opening misaligned with said locking means and the keyhole of said lock to prevent the direct picking thereof and being adequately large to permit the insertion of the fingers to operate said locking means.

4,350,033

METHOD AND MECHANISM FOR CONSTANT-MEASURE FEED OF ROD MATERIALS

Masamitsu Ishihara, 628 Hirai, Kannami-cho, Tagata-gun, Shizuoka-ken, Japan

Filed Jun. 24, 1980, Ser. No. 162,423
Claims priority, application Japan, Dec. 27, 1979, 54-172001; Dec. 27, 1979, 54-172002; Mar. 25, 1980, 55-39249[U]
Int. Cl.³ B21D *43/26*
U.S. Cl. 72—24 16 Claims



1. A method for constant-measure feed of rod materials comprising steps of:

bringing a feed member fixed to conveyor means into contact with the rear ends of rod materials and conveying said rod materials together with said feed member along guide means by said conveyor means;

causing the forward ends of said rod materials to abut against a movable stopper disposed in a normal position and further conveying said rod materials while holding said rod materials between said stopper and said feed member; and

sensing a movement of said stopper for a predetermined distance from said normal position and stopping said conveying operation of said conveyor means.

4,350,034

METAL DRAWING COMPOUND COMPOSITION AND METHOD OF USE

James L. Godek, Lincoln Park, and Lawrence P. Gowman, West Bloomfield, both of Mich., assignors to Wayne Chemical Products Company, Detroit, Mich.

Continuation-in-part of Ser. No. 50,753, Jun. 21, 1979, Pat. No. 4,262,057. This application Oct. 23, 1980, Ser. No. 199,734
The portion of the term of this patent subsequent to Apr. 14, 1998, has been disclaimed.
Int. Cl.³ B21B *45/02*; B21C *1/00*
U.S. Cl. 72—42 3 Claims

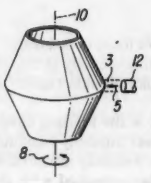
1. In a process of working metal pieces, the steps which comprise (1) coating the surface of the metal with a drawing compound by applying thereto an aqueous solution of a mixture of a soap and a compound which produces a borate ion, the soap and the borate ion producing compound having relative proportions of from about 1:4 to about 4:1 and said aqueous solution having a pH within the range of from about pH 7.6 to less than about pH 9, and thereafter (2) working said metal piece.

4,350,035

METHOD OF SHAPING OBJECTS BY MEANS OF A SOLID-PARTICLE BLAST APPLIED TO ONE SIDE THEREOF

Reiner Kopp, Kelmiser Strasse 13, and Klaus-Peter Hornauer, Nizzaallee 79, both of Aachen, Fed. Rep. of Germany

Filed Feb. 14, 1980, Ser. No. 121,421
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1979, 2906509
Int. Cl.³ B24C *1/10*
U.S. Cl. 72—53 14 Claims



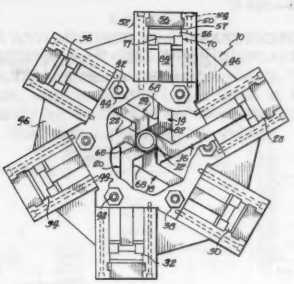
1. In a method of shaping a workpiece consisting of a material capable of elastic and permanent deformation and which is regionally deformable in at least one direction, wherein a solid particle jet of a blasting medium is effectively applied to one side of the workpiece with a ratio of kinetic-energy to surface-area which depends on the thickness and strength of the material, the improvement comprising:

subjecting a defined geometrically regular surface area of the workpiece to deformation by impingement of at least one solid particle blast jet means directed substantially perpendicular to the defined surface area by moving the workpiece and the particle jet relative to each other, wherein any cross-section of the solid particle blast jet taken at a right angle to the direction of propagation defines a geometric planar figure substantially the same size as that of the defined surface area, and wherein deformation is substantially uniform about the center of the defined surface area; whereby the defined surface area is deformed toward the solid particle blast means to a degree beyond that which can be achieved by bending other than by using solid particle blast means, and wherein the workpiece utilized is a body of revolution and the relative motion is a rotation of the workpiece about its longitudinal axis.

4,350,036
APPARATUS FOR POINTING WORK PIECES

Raymond L. Valente, Kankakee, Ill., assignor to Vale Industries Inc., Pontiac, Ill.

Filed Feb. 7, 1980, Ser. No. 119,356
Int. Cl.³ B21D *41/04*
U.S. Cl. 72—402 11 Claims



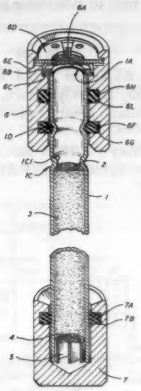
1. A tube shaping machine comprising a plurality of dies each having a substantially continuous, unbroken working surface, a substantially straight support leg for supporting said working surface and for defining lateral side portions thereof and forming a predetermined angle with respect to said working surface, and a substantially straight actuating leg for driving said support leg and formed continuously therewith and at a second predetermined angle with respect thereto, means for mounting said dies and for aligning said working surfaces one adjacent to the next so as to form a tube-receiving aperture therethrough, which aperture defines in cross-section a regular polygon, and means for simultaneously reciprocating each of said plurality of dies along a predetermined straight line throughout a range of positions between a fully open position and a fully closed position of said tube shaping machine while maintaining a similar regular polygonal cross-sectional shape of said tube-receiving through aperture throughout said range of positions.

4,350,037
PERSONAL GAS MONITOR

Peter Higham, High Wycombe, England, assignor to Perkin-Elmer Limited, England

Filed Dec. 5, 1980, Ser. No. 213,249
Claims priority, application United Kingdom, Jul. 12, 1979, 7942327
Int. Cl.³ G01N *1/22, 7/04*
U.S. Cl. 73—23 36 Claims

1. A molecular-diffusion personal gas monitor compatible with thermal desorption of the gases adsorbed within the monitor, comprising:- a longitudinally extending hollow body into which gases can diffuse by molecular diffusion via one end thereof representing the diffusion end and through which gases can be back-flushed following thermal desorption; a low-compressibility partition pervious to said gases but not to the adsorbent, said partition being located in a predetermined longitudinal axial position within the hollow body so as to present a free surface facing the diffusion end at a predetermined distance therefrom; means including the said partition for retaining a column of adsorbent within the hollow body, with one end of the column abutting against the surface of the partition opposite said free surface; and a diffusion screen at the diffusion end in predetermined spaced relation to the partition so as to define a stagnant diffusion zone of predetermined volume therebetween, the spacing being no less than about twice the average breadth of the diffusion zone measured at right angles to the

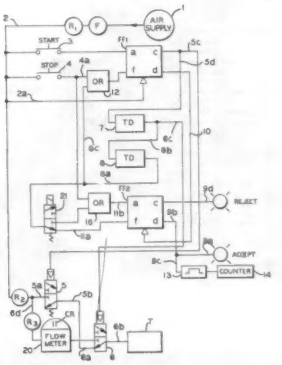


longitudinal axis of the hollow body and said average breadth being no less than 3 mm.

4,350,038
FLUIDIC TYPE LEAK TESTING MACHINE

Donald T. Soncrant, Toledo, Ohio, assignor to The Stellhorn Company, Toledo, Ohio

Continuation-in-part of Ser. No. 151,383, May 19, 1980, abandoned. This application Oct. 16, 1980, Ser. No. 197,549
Int. Cl.³ G01M *3/32*
U.S. Cl. 73—49.2 13 Claims



1. In a leak testing apparatus for a hollow body having a main source of pressurized air and a regulated source of pressurized air, a fluid charge connection between the hollow body and said regulated source including a fluid actuated normally closed charge valve and a fluid actuated normally open test valve, a fluid test connection between the hollow body and a test source of pressurized air including a flow meter, said flow meter including contact means that are actuated by a predetermined leakage flow through said flow meter, fluid means including a fluidic memory unit for actuating said charge valve to establish said charge connection and for actuating a first fluid time delay, said test valve being responsive to the time out of said first fluid time delay for interupting said charge connection to establish said test connection, a second fluid time delay actuated in response to the time out of said first fluid time delay, means responsive to actuation of said flow meter contact

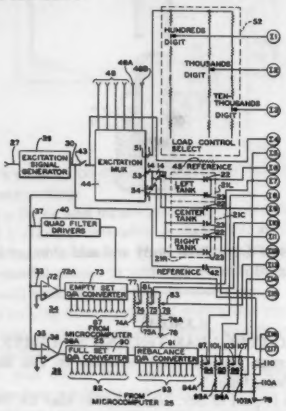
means for indicating a leaking hollow body, and means responsive to the time out of said second fluid time delay for resetting said fluid memory unit to deactuate said charge valve.

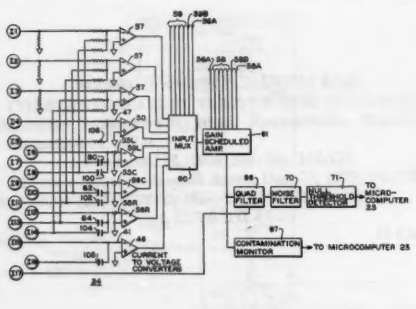
4,350,039

LIQUID GAGING SYSTEM NULL BALANCE CIRCUITRY

Martin J. van Dyke, Brooklyn Park, and Jerome A. Fahley, Fridley, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 14, 1980, Ser. No. 149,789
Int. Cl.³ G01F 23/26
U.S. Cl. 73—304 C **53 Claims**





1. Apparatus for nulling a signal from a capacitive sensor means with a signal from a reference comprising:

capacitive sensor means for providing a liquid measurement signal;

reference means for selectively providing a series of reference signals having predetermined amplitudes, the reference means having terminal means for receiving a series of rebalance approximation sequence control signals for selectively controlling the signal amplitudes, the rebalance approximation sequence control signals being generated through a successive approximation sequence;

computing means for generating the series of rebalance approximation sequence control signals through the successive approximation sequence, the computing means being connected to the reference means; and

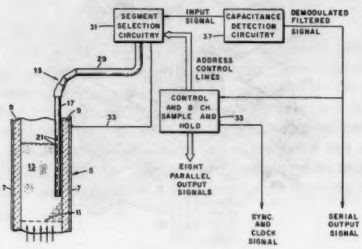
null detecting means for detecting the presence of a null, the null detecting means being connected to the capacitive sensor means and the reference means.

4,350,040

CAPACITANCE-LEVEL/DENSITY MONITOR FOR FLUIDIZED-BED COMBUSTOR

George E. Fasching, and Carroll E. Utt, both of Morgantown, W. Va., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 26, 1980, Ser. No. 163,368
Int. Cl.³ G01F 23/26; G01R 27/26
U.S. Cl. 73—304 C **5 Claims**



1. A capacitance based density/level monitor for a fluid-like medium within an electrically conductive containment vessel comprising:

a capacitance probe adapted to be vertically disposed in said medium and including an electrically conductive housing, a plurality of electrically conductive segments dispposed vertically of said housing, each of said segments separately insulated from said housing;

means for applying a predetermined frequency excitation voltage between said containment vessel and said probe housing, thereby generating a current through said medium;

a capacitance detection circuit means for separately detecting the quadrature component of said current flowing through said medium in the presence of a resistive current component which is in phase with said excitation voltage and generating a voltage at an output thereof indicative of the selected probe segment-to-vessel wall capacitance, including an operational amplifier having an inverting input forming a current summing junction for receiving said selected probe segment current and a feedback current, means for applying said selected probe segment current to said current summing junction, synchronous detection circuit means operable in response to said excitation voltage for separately synchronously detecting the capacitive and resistive voltage components of the voltage signal at the output of said operational amplifier corresponding to the capacitive and resistive components of said selected probe segment current and generating voltages at separate outputs thereof corresponding to said capacitive and resistive component voltages respectively, a gate-controlled amplifier means for generating said feedback current at an output thereof coupled to said current summing junction of said operational amplifier and further including a gate control input connected to said resistive component voltage output of said synchronous detection circuit means for varying the gain of said amplifier in response to the amplitude of said resistive component voltage and a phase-adjusting circuit means responsive to said excitation voltage for generating a selected phase voltage input to said gate-controlled amplifier to provide the proper phase for said feedback current to cancel the resistive component current of said selected probe segment current applied to said summing junction;

segment selection circuit means responsive to a control signal for separately connecting each of said plurality of segments of said probe in a selected sequential order to the input of said capacitance detection circuit means;

sampling circuit means having a plurality of sampling channels corresponding to said plurality of probe segments for sampling the output voltage from said detection circuit means

from corresponding ones of said plurality of probe segments in response to said control signal; and

control circuit means for generating and applying said control signal to control inputs of said segment selection circuit means and said sampling circuit means to select and sample the corresponding segment detected capacitance signal at a preselected sampling rate.

4,350,041

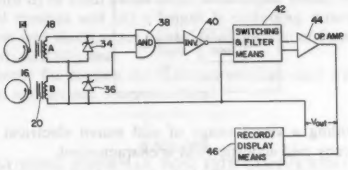
SYSTEM AND METHOD FOR MEASUREMENT OF DYNAMIC ANGULAR OR LINEAR DISPLACEMENT

Aleck Loker, Leonardtown, and Richard Archibald, Hollywood, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 9, 1980, Ser. No. 195,444

Int. Cl.³ G01M *13/02*

U.S. Cl. 73—432 R **9 Claims**



1. Apparatus for measuring the linear or angular displacement between two, coupled, movable members comprising:

first reference means attached to a first member for marking a reference location thereon;

second reference means attached to a second member for marking a reference location thereon;

first pulse means for deriving a first pulse from the first reference means;

second pulse means for deriving a second pulse from the second reference means;

first means for converting said first pulse to a first logic level pulse;

second means for converting said second pulse to a second logic level pulse;

AND means for combining said first and second pulses to produce an AND pulse having a time duration equal to the overlap time of said first and second pulses, any change in the time duration of an AND pulse and prior AND pulses being proportional to a displacement between said coupled members; and

means for utilizing said AND pulse.

4,350,042

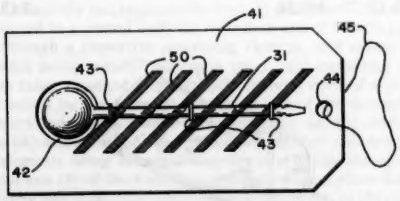
TIME-DEPTH INTEGRATOR

Douglas MacGregor, 972 E. 5650 South, Salt Lake City, Utah 84121

Filed Jan. 12, 1981, Ser. No. 223,990

Int. Cl.³ G01F *23/14*

U.S. Cl. 73—432 R **8 Claims**



1. A time-depth integrator for indicating when a diver is approaching or has reached the maximum safe limit for diving without requiring decompression procedures when surfacing comprising:

(a) An evacuated chamber;

(b) An elongate channel communicating at one end with the evacuated chamber and sealed at its other end, such seal adapted to be broken;

(c) An orifice located in the end of the channel away from the chamber for restricting flow of fluid into the channel after the seal on such channel has been broken; and

(d) An indicator along said channel to show when the maximum safe limit has been reached and the approach thereto.

4,350,043

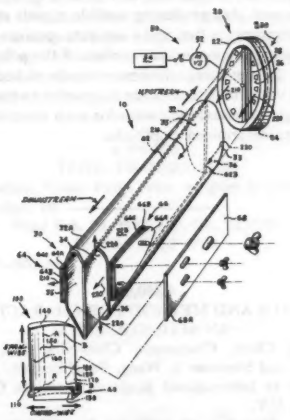
AIRFOIL VIBRATION TEST APPARATUS

Carmen B. Jones, West Chester, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 4, 1980, Ser. No. 212,956

Int. Cl.³ G01H *13/00*

U.S. Cl. 73—579 **12 Claims**



1. An apparatus for inducing vibrations in a plate type structure, comprising:

a. a source of pressurized gas;

b. means, in communication with said source of pressurized gas, for selectively generating a flow of said pressurized gas in two out-of-phase pressure pattern streams of gaseous flow;

c. means, connected to said pressurized gaseous flow generating means, for conducting and directing said two out-of-phase pressure pattern streams of gaseous flow from said pressurized gaseous flow generating means to said plate type structure;

d. and, means for holding and supporting said plate type structure in alignment with said means for conducting and directing said two out-of-phase pressure pattern streams of gaseous flow, such that said streams impinge upon, and induce vibrations in, two adjacent portions of said plate type structure.

4,350,044

METHOD OF AND APPARATUS FOR TESTING WOODEN POLES

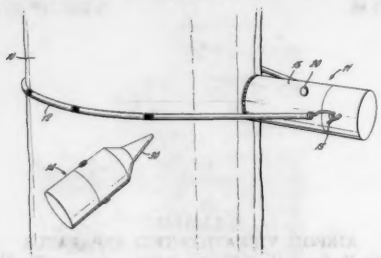
Roy Richardson, Leeds, and Bernard Czenkusz, Bradford, both of England, assignors to Yorkshire Electricity Board, Leeds, England

Filed Dec. 17, 1980, Ser. No. 217,330

Claims priority, application United Kingdom, Dec. 19, 1979, 7943725

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—600 **13 Claims**



1. Apparatus for testing a wooden pole comprising a transmitter unit arranged to produce regularly repetitive pulses of ultrasonic energy for transmission into the pole transversely thereof when the transmitter unit is secured to a pole, the transmitter unit also producing audible signals synchronised with the ultrasonic pulses, and a separate receiver unit having a probe for placing against the surface of the pole, a receiver transducer for detecting ultrasonic signals picked up by the probe, and visual indicator means responsive to the transducer output to give a visual indication for each received pulse exceeding a predetermined amplitude.

4,350,045

APPARATUS AND METHOD FOR CHARACTERIZING AN ACOUSTIC FIELD

Chao-Kong Chow, Chappaqua; Chao-Ning Liu, Yorktown Heights, and Sherman S. Wang, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 25, 1980, Ser. No. 162,995

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—607 **2 Claims**

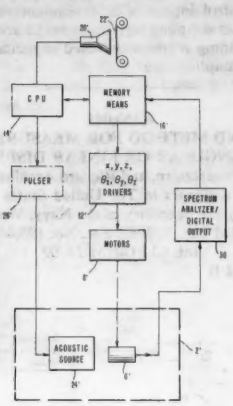
1. An apparatus for characterizing an acoustic field in a medium, comprising:

acoustic source transducer means disposed in said medium for generating acoustic energy resulting in said acoustic field to be characterized,

acoustic receiving transducer means physically separated in said medium from said source means for converting a parameter of the acoustic energy of said field to a corresponding electrical signal,

means for moving said acoustic receiving transducer means in steps to a plurality of predetermined X,Y,Z coordinate positions in an area of interest in said acoustic field, said means for moving including means for rotating said transducer means in steps to a plurality of angular positions at each X,Y,Z coordinate position in three different angular directions,

means for storing the electrical signals provided by said transducer means or signals derived from said electrical signals for each of said plurality of positions, and display means for



providing a visual image of said stored electrical signals, whereby said acoustic field is characterized.

4,350,046

CABLE STRAIN MONITORING

Colin S. Parfree, and Peter Worthington, both of Southampton, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 13, 1980, Ser. No. 206,427

Claims priority, application United Kingdom, Nov. 15, 1979, 7939607

Int. Cl.³ G01B *7/16*

U.S. Cl. 73—768 **4 Claims**

1. A method of monitoring the strain to which the optical fibres of an optical fibre cable are subjected comprising:

providing said cable with at least one metallic element, the electrical resistance of the material of the element being variable with the strain to which the element is subjected,

positioning said metallic element with at least one optical fiber having a sheath into said optical fibre cable,

applying a current through said metallic element, and

monitoring the electrical resistance of said metallic element during assembly of the cable.

4,350,047

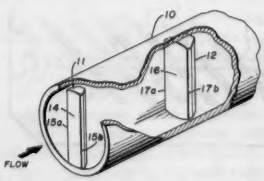
VORTEX-SHEDDING FLOWMETER HAVING TWO BLUFF BODIES

Clarence F. Dewey, Jr., Marblehead, Mass., and David E. Wiklund, Marshalltown, Iowa, assignors to Fisher Controls Company, Inc., Marshalltown, Iowa

Filed Sep. 18, 1980, Ser. No. 188,188

Int. Cl.³ G01F *1/32*

U.S. Cl. 73—861.22 **7 Claims**



1. A vortex-shedding flowmeter comprising a conduit

through which a fluid flows and disposed therein in the direction of fluid flow

(a) a first stationary vortex shedding cross-member extending across the interior of said conduit transversely to the direction of fluid flow, said first cross-member having (i) an upstream bluff surface disposed transversely to the direction of fluid flow having sharp Karman vortex-generating edges with an edge to edge width d_1 of from about 10 to 40% of the inside width of said conduit and (ii) a length l_1, extending downstream from said sharp edges of said bluff surface, of from about $0.3d_1$ to $2.0d_1$.

(b) a second stationary vortex-shedding cross-member disposed downstream from said first cross-member a distance B of from about $4d_1$ to $15d_1$, said second cross-member being disposed across the interior of said conduit transversely to the direction of fluid flow, said second cross-member having (i) an upstream bluff surface disposed transversely to the direction of fluid flow having sharp Karman vortex-generating edges with an edge to edge width d_2 of from about 10 to 40% of the inside width of said conduit and (ii) a length l_2 extending downstream from said sharp edges of said bluff surface of from about $0.3d_2$ to $2.0d_2$, and

(c) means for sensing the Karman vortices shed from said first and second cross-members:

4,350,048

MEASURING JOURNAL FOR THE CONVERSION OF FORCE TO ELECTRIC SIGNAL

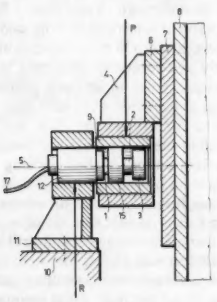
Sandor Kovacs, Budapest, Hungary, assignor to Vasipari Kutato Intezet, Hungary

Filed Oct. 23, 1979, Ser. No. 87,532

Claims priority, application Hungary, Jan. 10, 1979, VA 1538

Int. Cl.³ G01L *1/22, 5/00*

U.S. Cl. 73—862.54 **6 Claims**



1. Measuring journal for conversion of a force to an electric signal said measuring journal including at least two elongated torsion measuring elements having strain measuring sensors thereon, and where a force (P) bringing about a torsion force and a reaction force (R) to the torsion force act on the measuring elements, characterized in that said measuring elements (**1, 2**) are relatively and respectively long (**1**) and short (**2**) and are connected to a central body (**3**) with each axis of torsion passing through a respective measuring element, said measuring elements being parallel with each other, said measuring elements being arranged symmetrically on both sides of a plane determined by the force (P) acting on one of the measuring elements and bringing about a torsion force and the reaction force (R) acting on the other measuring element said measuring elements being arranged eccentrically in relation to the central axis (**5**) of the measuring journal, while a plane determined by said measuring elements is perpendicular to the plane determined by the reaction force (R) and by the force (P) bringing about the torsion, one of the ends of each of said measuring elements (**1, 2**) being respectively coupled to said connecting elements (**12, 15**) which take up the force (P) bringing about the torsion, as well as the reaction force (R), while the other ends of said measuring elements (**1, 2**) are in rigid connection with each other.

4,350,049

DEVICE AND PROCESS FOR DRAWING OFF VERY SMALL QUANTITIES OF POWDER

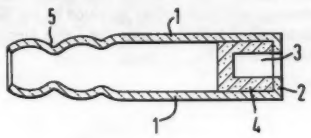
Arun R. Gupte; Heinrich Kladders, and Helmut Struth, all of Ingelheim am Rhein, Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Nov. 5, 1980, Ser. No. 204,225

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945212

Int. Cl.³ G01N *1/14*

U.S. Cl. 73—864.51 **5 Claims**



1. An apparatus for drawing off powder in metered quantities of from about 0.5 to 10 mg, comprising a tubular member having a dosing chamber at one end, the dosing chamber having walls consisting of porous material and the outer surfaces of the dosing chamber walls being air-tight against the inner wall of said tubular member, and being provided at the other end with a means for connecting the tubular member to vacuum and/or compressed air sources.

4,350,050

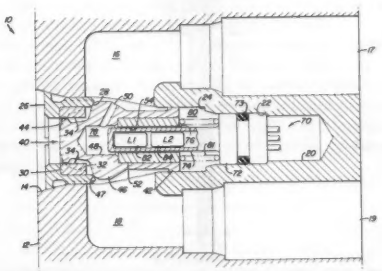
FLOW TRANSDUCER

Roger J. Nelson, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 10, 1981, Ser. No. 233,279

Int. Cl.³ G01F *1/24*

U.S. Cl. 73—861.54 **13 Claims**



1. A fluid flow transducer, comprising:

a housing defining a flow path for fluid flow therethrough;

a hollow metering member fixed in the housing and defining a portion of the flow path and having a plurality of ribs extending radially inwardly therefrom;

a flow-responsive valve member movably mounted in the housing and having a variable position therein depending upon the rate of forward fluid flow through the flow path, the valve member comprising a generally cylindrical body having a blind bore extending therein from one end of the

body, the body having a first radial projection extending outwardly from the one end for slidably engaging the housing, having a second radial projection extending outwardly from the other end of the body for slidably engaging the plurality of ribs, the second projection being received by the metering member and cooperating therewith to define a variable flow restriction therebetween and having a third radial projection located axially between the first and second projections, the first and second projections cooperating with the housing and the ribs, respectively, to maintain axial alignment of the valve member;

a check valve seat fixed in the flow path for sealingly engaging a surface of the third projection to prevent reverse fluid flow through the flow path;

variable reluctance sensing means coupled to the valve member for sensing the position of the valve member, the sensing means including a first part movable with the valve member and a second part fixed with respect to the housing, both parts being received by the blind bore; and

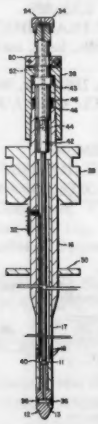
resilient means biased to urge the valve member towards a no-flow position.

4,350,051

INTERSTITIAL GAS PROBE

C. Keith Thompson, 11417 W. Ricks Cir., Dallas, Tex. 75230

Filed Jul. 7, 1981, Ser. No. 281,173
Int. Cl.³ G01N *1/22*
U.S. Cl. 73—864.74 **18 Claims**



1. A probe for use in withdrawing subsurface soil gas samples, said probe comprising:

an elongated shaft capable of being driven into the soil, said elongated shaft including a passage for removal of subsurface soil gas samples;

a probe tip assembly, including a sealing surface, mounted at a first end of said passage;

sealing means disposed within said passage; and

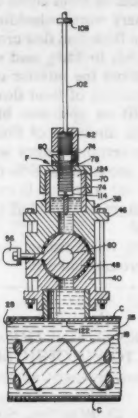
actuating means at a second end of said passage for selectively enabling said sealing means to engage said sealing surface.

4,350,052

APPARATUS AND METHOD FOR TAPPING AND EXTRACTING OIL SAMPLES FROM AN UNDERGROUND HIGH PRESSURE PIPE-TYPE TRANSMISSION CABLE SYSTEM

Robert W. Kendall, Seabrook, Md., assignor to Elizabeth Virginia Kendall, Wilmington, N.C.

Filed Jul. 30, 1980, Ser. No. 173,820
Int. Cl.³ G01N *1/10*
U.S. Cl. 73—863.86 **12 Claims**



1. Apparatus for tapping and extracting an oil sample from a high pressure pipe-type transmission cable system comprising valve means operatively attached to the exterior of said pipe, said valve means being operable to open and closed positions to permit access therethrough to said pipe, a fitting operatively attached to said valve means remote from said pipe, said fitting having a bore therethrough in communication with said valve, a drill bit slidably and rotatably extending through said bore and said valve means when in an open position, with a work end thereof being engageable with said pipe, and the remote end being adapted for connection to a drill driving means, resilient fluid sealing means operatively mounted in said bore in said fitting, a fluid sealing bushed packing nut in operative adjustable engagement on the free end of said fitting, said drill bit extending through said fluid sealing means and said bushed packing nut, stop means on said drill bit external of said fitting, said stop means being adjustable on said drill bit to limit depth of a tap hole drilled in said pipe to the wall thickness thereof, said sealing means and said bushed packing nut being operative to permit drilling of the tap hole while maintaining normal oil pressure in said system, partial withdrawal of said drill bit subsequent to drilling the tap hole permitting oil flow into said fitting and a subsequent closure of said valve means sealing off pressurized oil flow from said pipe, said fitting including an adjustable cap movable toward and away from the fitted end and operable, upon adjustment away from the fitting end, to increase the interior volume of said fitting and thereby relieve pressure of oil contained in the fitting and permitting a subsequent opening of the fitting to permit access to pressure relieved and therefore non-pressurized oil contained therein.

4,350,053

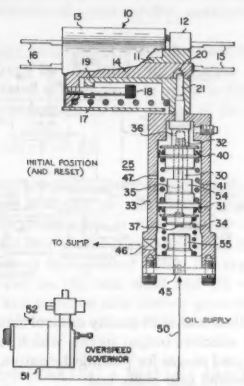
FLUID PRESSURE ACTUATING DEVICE

Philip M. Folger, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Sep. 5, 1980, Ser. No. 184,495
Int. Cl.³ F16H *5/48*
U.S. Cl. 74—2 **8 Claims**

1. A fluid pressure responsive actuator comprising a piston housing, an actuating piston and piston rod slidably mounted

within said housing and having an actuating portion extending through said housing, said rod having a peripheral abutment within said housing spaced from said actuating piston, said actuating piston and rod having a constricted axial fluid passage therethrough with one end of said passage terminating in a lateral fluid port in a portion of said rod inside said housing but outside the space between said abutment and actuating piston, a floating piston slidably mounted on said rod intermediate said abutment and said actuating piston, said abutment and actuating piston constituting limiting stops for movement of said floating piston in opposite directions on said piston rod,



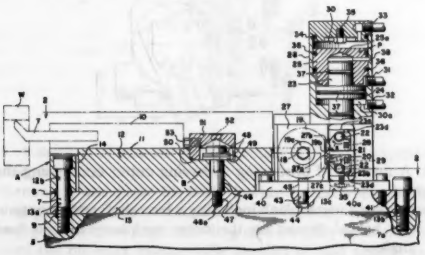
an actuating spring within said housing biasing said actuating and floating pistons into spaced apart relationship on said rod, a reset spring biasing said actuating piston toward one end of said housing with a force less than the force of said actuating spring, and means for admitting fluid under pressure to a chamber formed between said actuating piston and the other end of said housing, whereby upon abrupt reduction of fluid pressure in said chamber said actuating piston and rod are quickly moved by said actuating spring to a limiting positon at said other end of said housing and then returned by said reset spring to a limiting position at said one end of said housing independently of restoration of fluid pressure in said chamber.

4,350,054

REMOTELY CONTROLLED TOOL ARM ASSEMBLY

Carl H. Werth, Jr., Bridgeport, Mich., assignor to Werth Engineering Inc., Bridgeport, Mich.

Filed Mar. 31, 1980, Ser. No. 135,497
Int. Cl.³ F16H *27/02, 31/00*
U.S. Cl. 74—128 **13 Claims**



1. In a tool arm assembly having a longitudinally extending base means adapted to be supported on a machine tool adjacent a workpiece rotating spindle, a tool carrier means mounted on the base means and having a position adjustable portion adapted to support the tool; and motion transmission means operatively connected to adjust the position of the portion relative to the base means and spindle and thereby adjust the position of the tool relative to the workpiece;

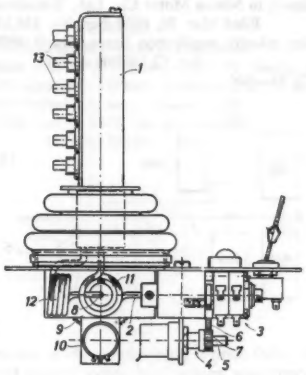
the improvement wherein a multi-toothed, bi-directional actuator movable in precise increments in opposite directions, is provided on the assembly to operate the motion transmission means; intermittently driven toothed means is carried by the base means for movement in a path of travel for moving the actuator incrementally in either direction; and cam means on the base means mounted in the path of movement of said toothed means coacts with the toothed means to determine in which direction the actuator is driven.

4,350,055

LEVER OPERATED CONTROL APPARATUS

Sakari Pinomäki, SF-39160 Julkujarvi, Finland

Filed May 23, 1980, Ser. No. 152,466
Claims priority, application Finland, May 29, 1979, 791713
Int. Cl.³ G05G *9/02*
U.S. Cl. 74—471 XY **3 Claims**



1. A lever-operated control apparatus comprising:

two shafts, said shafts supported transverse to each other, the shafts connected to drive control devices,

a lever supported to rotate in a first plane normal to one shaft and in a plane in the direction of the one shaft; and

two spring elements connecting the lever and the shafts, said spring elements being the only members coupling control movement from the lever to the shafts, said spring elements maintaining the lever in a neutral position when said lever is not being rotated.

4,350,056

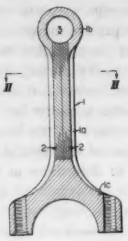
CONNECTING ROD OF AN INTERNAL COMBUSTION ENGINE

Keisuke Ban, Fujimi, and Akimasa Daimaru, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1980, Ser. No. 177,893
Claims priority, application Japan, Aug. 17, 1979, 54-104753
Int. Cl.³ G05G *1/00;* B22D *19/02;* B32B *15/14*
U.S. Cl. 74—579 E **10 Claims**

1. A connecting rod for an internal combustion engine comprising a rod body and a fiber bundle integrated in said rod body to reinforce said body, said rod body including a small

end portion with a bore therein, a central rod portion and a large end portion, said fiber bundle extending in said central



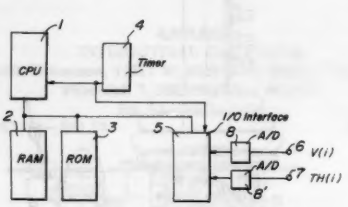
rod portion and being exposed at said small end portion at said bore.

4,350,057

SHIFT CONTROL SYSTEM FOR A VEHICLE AUTOMATIC TRANSMISSION

Norimasa Kishi, and Tadashi Suzuki, both of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 28, 1980, Ser. No. 135,155
Claims priority, application Japan, Apr. 3, 1979, 54-39352
Int. Cl.³ B60K *41/06*
U.S. Cl. 74—866 **6 Claims**



1. In a shift control system for a vehicle automatic transmission comprising engine load sensor means for producing a signal corresponding to the engine load; vehicle speed sensor means for producing a signal corresponding to an actual vehicle speed; and means responsive to said signals from both of said engine load sensor means and said speed sensor means for selecting a reference shifting speed corresponding to an associated engine load from a predetermined relationship between the engine load and a plurality of reference shifting speeds, for comprising said selected reference shifting speed with the actual vehicle speed and for deciding whether shifting is needed or not, the improvement comprising means for extracting from said speed sensor signal a signal which corresponds to said engine load sensor signal and appears after a predetermined amount of time from said corresponding engine load sensor signal, said signal as extracted being used in said deciding means upon a decision of the necessity of shifting.

4,350,058

TRANSMISSION CONTROL SYSTEM FOR MULTI-RATIO GEAR ARRANGEMENT

Alan L. Miller, Mt. Prospect, Ill., and John S. Ivey, Ithaca, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

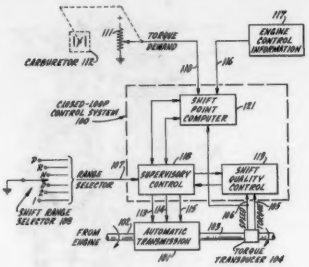
Continuation of Ser. No. 947,212, Sep. 29, 1978, abandoned. This application Nov. 10, 1980, Ser. No. 205,217
Int. Cl.³ B60K *41/08, 41/10*
U.S. Cl. 74—866 **20 Claims**

1. A control system for regulating gear ratio changes in a multi-ratio automatic transmission coupled between an engine and an output mechanical drive connection, which transmission has at least 3 forward speeds, comprising:

gear ratio command means operative to provide a ratio-change command signal upon receiving information input signals including range selector information;

a supervisory logic circuit, connected to receive the ratio-change command signal and to receive range selector information, and to provide a shift-initiate signal when a gear ratio change is indicated;

a routing logic circuit, connected to receive said shift-initiate signal from the supervisory logic circuit, range selector



information, and shift quality control signals, operative to provide selective output signals which respectively regulate selected means for placing the automatic transmission in the desired gear ratio, and

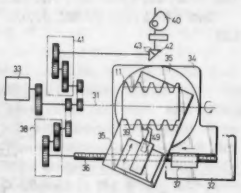
only one upshift control circuit, connected to regulate the 1–2 and 2–3 upshifts, and only one downshift control circuit connected to regulate the 3–2 and 2–1 downshifts, each connected to provide said shift quality control signals to the routing logic circuit upon receipt of the appropriate shift-initiate signal from the supervisory logic circuit.

4,350,059

METHOD OF PRODUCING SHAVING CUTTER

Masato Ainoura, 1253 Eguchi, Kita-Shigeyasu-cho, Miyaki-gun, Saga-ken, Japan

Division of Ser. No. 39,237, May 15, 1979, Pat. No. 4,280,773. This application Jun. 30, 1980, Ser. No. 164,736
Claims priority, application Japan, May 31, 1978, 53-65360; Mar. 20, 1979, 54-32469
Int. Cl.³ B21K *21/00*
U.S. Cl. 76—101 A **9 Claims**



1. A method of producing a shaving cutter comprising the steps of:

preparing a metal blank including a base shaft and a continuous helical thread on the outer periphery of said base shaft;

rotating said base shaft continuously at a constant speed;

reciprocating a cutting tool toward and away from said base shaft and laterally moving said cutting tool continuously parallel to said base shaft to form a plurality of cutting grooves on a flank of said thread, said cutting grooves extending from an inner end adjacent to said base shaft to

an outer end radially outwardly away from the shaft so that the cutting grooves are inclined at angles between 15° and 90° relative to lines extending radially outwardly from said base shaft in the direction opposite to the rotational direction of the shaft for shaving, said cutting grooves respectively defining lands therebetween having cutting edges at leading edges thereof for cutting teeth surfaces of a gear to be shaved; and

controlling said lateral and reciprocal movement of said cutting tool to synchronize with rotation of said base shaft, said reciprocal movement of said cutting tool being actuated by rotation of a cam member associated with said base shaft,

said cam member having a cam contour which exhibits a depression given by the following equation as the cam member is rotated at an angle θ, in order to form logarithmic spiral cutting edges on said thread of the base shaft,

$$\Delta S = Ro[1-\exp(-\theta \cot \xi)]$$

wherein ξ represents an angle formed between the radial line from said base shaft at a point on said cutting edge and a line tangential to said cutting edge at said point; θ represents a central angle of said base shaft between the point at which the cutting is commenced and another point; Ro represents the radius of said thread on the base shaft and ΔS represents a radial depression at a point on said cutting groove.

4,350,060

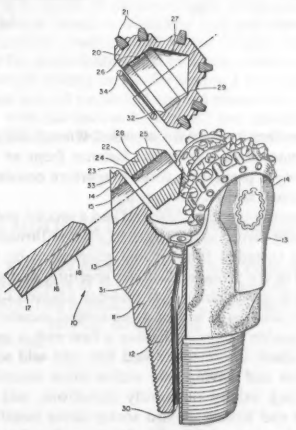
METHOD OF MAKING A ROTARY ROCK BIT

Edward Vezirian, Irvine, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Division of Ser. No. 3,246, Jan. 15, 1979, Pat. No. 4,266,622. This application Aug. 25, 1980, Ser. No. 180,595

Int. Cl.³ E21B *9/10*

U.S. Cl. 76—108 A **10 Claims**



1. A method of manufacturing a rotary rock bit comprising the steps of:

forming a one piece bit body having an external annular gage surface and a central axis, said bit body further having at least two legs extending downwardly from the rest of the bit body substantially parallel to said central axis along the gage surface, said legs forming an open area therebetween, below the rest of the bit body;

drilling a bore through each leg;

providing a cone type cutter for each leg, each cutter having an interior cavity;

positioning each cone cutter within said open area such that the cavity of each cutter is aligned with the bore of a respective leg;

inserting a separate journal pin through the bore of each leg from the external side thereof until a portion of each journal pin extends into the cavity of the registering cone cutter;

providing at least two thrust elements having central bores, each thrust element cooperating with their respective journal pin to retain the cone cutter on the journal pin;

positioning each thrust member into the cavity of each cone cutter and retaining it therein to form subassemblies;

forming an annular shoulder on each thrust member, providing an annular member to engage the shoulder of each thrust member after it is positioned within the cavity of each cone cutter, and securing each annular member to the respective cone cutter; and

securing each journal pin to the bore of the respective leg.

4,350,061

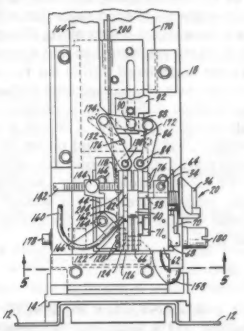
WIRE STRIPPING MECHANISM

Leonard E. Isham; Marvin J. Peplow; Julius W. Sandy, all of Sycamore, and Clyde M. ViPond, Waterman, all of Ill., assignors to Ideal Industries, Inc., Sycamore, Ill.

Filed Nov. 1, 1979, Ser. No. 90,398

Int. Cl.³ H02G *1/12*

U.S. Cl. 81—9.51 **16 Claims**

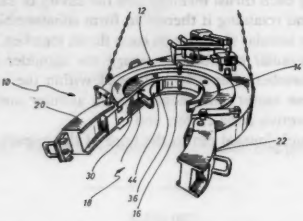


1. In a stripper mechanism for removing the insulation from the ends of insulated electric wires, a frame with a defined wire insertion path, a stripping station on the frame defined by a pair of gripping jaws and a pair of stripping jaws, the stripping jaws being movably mounted (relative to the gripping jaws) on the frame so as to define a separating action relative (thereto) to the gripping jaws in (a) the defined direction, at least one (the) of the jaws of each pair being movably mounted relative to the other jaws so as to perform an opening and closing action between them generally at right angles to the defined direction, the gripping jaws being fixed on the frame only an opening and closing action relative to the wire insertion path, a guide fixed on the frame so that it is contiguous to the gripping jaws at all times and positioned between the pairs of jaws with an opening therein defining a path of travel for the wire to be stripped when it is initially inserted between the jaws prior to a stripping action, and a collet fixed on the frame having a funnel shaped guide channel aligned with the opening in the guide and positioned on the opposite side of the gripping jaws from the guide.

4,350,062
POWER TONG

Garth M. Farr, Kingwood, Tex.; Terence D. McCoy, and Jiri Diask, both of Edmonton, Canada, assignors to Farr Oil Tool, Inc., Houston, Tex.

Continuation of Ser. No. 6,905, Jan. 26, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 203,652
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—57.18 5 Claims



1. An open-mouth power tong comprising:
a frame having a throat at its front;
a power-driven rotary gear having a mouth adapted for alignment with the throat, said rotary gear being rotatably mounted on the frame;
a pair of pivotally mounted jaws located on opposite sides of the center line of the tong and having their pivot points rearward of the center of rotation of the rotary gear;
a cam follower associated with each jaw;
pipe gripping elements carried by the jaws; and
at least one pair of opposed cam surfaces on the interior surface of the rotary gear, the cam surfaces of the pair being cooperatively shaped such that when the cam followers are cammed at points along the opposed cam surfaces the jaws are positioned so that a pipe section gripped therebetween is centered within the rotary gear;
said at least one pair of opposed cam surfaces comprising a first cam surface defined by a portion of a first circle having its center on the line X which is perpendicular to the centerline of the throat and passes through the center of the rotary gear, and a second cam surface defined by a portion of a second circle having a smaller radius than the first circle, with the center of the second circle located at the opposite side of the throat centerline and being offset from line X.

4,350,063
ADJUSTABLE WRENCH

Robert L. Koehler, 111 S. Wilmette, Westmont, Ill. 60559

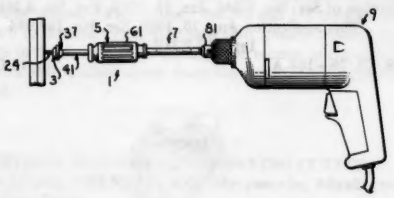
Filed Nov. 17, 1980, Ser. No. 207,240
Int. Cl.³ B25B *13/52*
U.S. Cl. 81—64 4 Claims

1. An adjustable wrench, comprising in combination,
a narrow, flexible band of spring material having therein a plurality of equally spaced, laterally extending slots,
a tubular socket member fixedly attached to said band near one end thereof, said band being formed into a generally circular loop with its other end portion extending through said socket member,
an elongated rectilinear handle rotatably mounted in said socket and having a worm gear portion threadedly engaging one or more of said slots so that rotation of said handle in one direction increases the size of said loop and rotation of said handle in the opposite direction decreases the size of said loop,
said socket member including a first generally tubular member having a slotted integral wall at one end through which said handle extends and with said other end being open, and
clip means movably mounted to said first member for movement into a first position over said open end into locking engagement with said handle to secure said handle in said socket member in engagement with the edges of said slot and for movement into a second position displaced from said open end out of engagement with said handle to permit removal thereof from said socket member, and
said handle, when locked in said socket, extends in a direction tangential to said loop.

4,350,064
AUXILIARY TOOL KIT FOR A SOCKET WRENCH SET

James R. Markle, 3410 Roberts, Kansas City, Mo. 64124

Filed Dec. 18, 1980, Ser. No. 217,664
Int. Cl.³ B25B *21/00*
U.S. Cl. 81—437 7 Claims



1. An auxiliary tool kit for a socket wrench set adapted to facilitate removal of a threaded fastener from an associated object having a previously formed aperture coaxial with the threads thereof; said kit comprising:
(a) an easy-out having a first end and a second end, said first end being threaded such as to be reverse threaded relative to said threaded fastener and adapted to be snugly received in the threaded fastener aperture; said second end having a socket drive first member adapted to be mated with an associated socket drive second member;
(b) a grippable extension having a first end, a second end, and a shank intermediate said first and said second end; said first end having said socket drive second member projecting axially outwardly therefrom; said extension second end having a third socket drive member therein adapted to be mated with a fourth socket drive member; said shank having a hand grip positioned therearound near said second end; said hand grip being fixedly positioned on said shank such as to prohibit rotational movement about a longitudinal axis thereof relative to said shank; and
(c) a drill adapter having a first end, a second end and a shank; said first end having said fourth socket member projecting outwardly therefrom; said second end having an elongate cylindrical member extending axially outward therefrom; said cylindrical member adapted to be operably received within a chuck of a reversible rotary drill, whereby said easy out can be operably rotated by said rotary drill.

4,350,065

RECIPROCATING TRAVELLING SHEAR

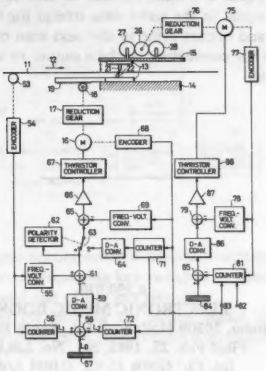
Shigeki Hayashi, Tokyo, and Mitsuo Kusakabe, Kobe, both of Japan, assignors to Nusco Kabushiki Kaisha and Kusakabe Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Nov. 10, 1980, Ser. No. 205,493

Claims priority, application Japan, Nov. 22, 1979, 54-151857

Int. Cl.³ B23D *21/00, 25/00*

U.S. Cl. 83—287 **11 Claims**



1. A reciprocating travelling shear comprising: a tool post which reciprocatingly travels in the travelling direction of a travelling material; a press mechanism which cuts said material with a cutting tool held by said tool post by raising or lowering a press ram; a first DS motor coupled to said press mechanism and used to drive it; first numerical control means which, in relation with the travel of said tool post, controls the rotation of said first DC motor to reciprocatingly move said press ram once in a vertical direction when said tool post passes a predetermined position; a second DC motor which, coupled to a mechanism for reciprocating said tool post, drives said mechanism; cut length setting means for setting a cut length of said material; and second numerical control means for controlling, in relation with the set cut length and the travelling of said material, said second DC motor to move said tool post reciprocatingly.

4,350,066

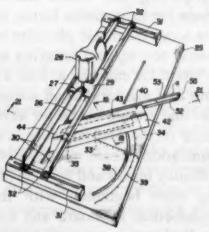
COVE MOLDING CUTTING APPARATUS AND ATTACHMENT

Michael J. Volk, 216 McKeon Rd., Severna Park, Md. 21146

Continuation-in-part of Ser. No. 128,554, Mar. 10, 1980, Pat. No. 4,320,678. This application Dec. 4, 1980, Ser. No. 212,888

Int. Cl.³ B27B *27/06, 11/04*

U.S. Cl. 83—763 **10 Claims**



1. An apparatus for cutting cove molding comprising a flat bed plate having at least one straight edge for the guidance of a saw blade, a cove molding rest on the bed plate disposed at an angle of 45 degrees to said straight edge and extending away from said edge in one direction, and said rest having a pair of flat parallel inclined upwardly converging side surfaces rising at angles of 45 degrees to the top face of the bed plate and extending for the entire length of said rest.

4,350,067

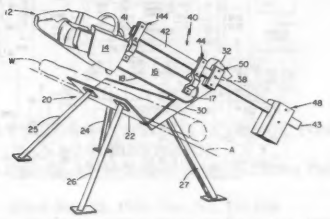
CHAIN SAW SUPPORT APPARATUS

George E. Picard, 418 Depot St., South Easton, Mass. 02375

Filed May 6, 1981, Ser. No. 261,007

Int. Cl.³ B27B *17/02*

U.S. Cl. 83—796 **6 Claims**



1. For use with a support structure having a horizontally extending supporting pin for supporting for operation a portable power chain saw having at one end a power unit including a handle, a motor and motor controls, and, extending from said power unit, a rigid chain saw bar having a free end and carrying around its periphery for movement in a vertical operating plane, a plurality of movable saw teeth driven by said motor

chain saw support apparatus for supporting said chain saw by said support structure for vertical swinging movement in said operating plane around said horizontal supporting pin

said support apparatus comprising

a rigid lever arm extending perpendicularly to said supporting pin and having, between its opposite ends, fulcrum means for receiving said horizontal supporting pin for supporting said lever arm for vertical swinging movement in said operating plane

suspension means on said lever arm between said fulcrum means and one end of said lever arm for removably suspending said chain saw bar beneath said lever arm with said chain saw bar extending in a direction toward said fulcrum means with its free end spaced therefrom toward said one end for bodily vertical swinging movement of said chain saw in said operating plane, and

counterweight means mounted on said lever arm between said fulcrum means and the other end of said lever arm for counterbalancing the weight of said chain saw power unit,

whereby said supported and counterbalanced chain saw may easily be manually swung by its handle between raised and lowered positions for cutting of a workpiece supported therebeneath.

4,350,068

ELECTRONIC MUSICAL INSTRUMENT WITH TONE PRODUCTION CHANNEL GROUPS

Hideo Suzuki, Shizuoka, and Makoto Kaneko, Hamakita, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jan. 27, 1981, Ser. No. 228,883

Claims priority, application Japan, Jan. 28, 1980, 55-8607; Apr. 30, 1980, 55-57713; Apr. 30, 1980, 55-57714

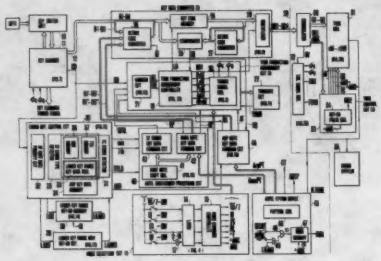
Int. Cl.³ G10H *1/057, 1/36, 7/00*

U.S. Cl. 84—1.01 **10 Claims**

1. An electronic musical instrument comprising:

a plurality of keys;

tone production means including a plurality of tone production channels of a number smaller than that of a total number of said keys;
means for detecting depressed keys;
mode selecting means for selecting a performance mode of the electronic musical instrument from among a plurality of performance modes, said tone production channels being divided into a plurality of channel groups and said keys into a plurality of key groups in accordance with the selected performance mode;



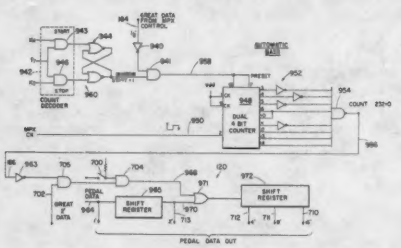
assigning means for assigning a tone production corresponding to a depressed key among said plurality of keys to one of said tone production channels, said channel group which said assigned channel belongs to corresponding to said key group which said depressed key belongs to;
detecting means for detecting the change of the performance mode and
control means for controlling tone production at said tone production channels when said detecting means has detected the mode change.

4,350,069

AUTOMATIC BASS GENERATOR FOR ELECTRONIC ORGAN

Stephen L. Howell, Huntingburg, Ind., assignor to Kimball International, Inc., Jasper, Ind.

Filed Dec. 29, 1980, Ser. No. 220,311
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—1.03 **16 Claims**



1. In an electronic organ including at least one keyboard having playing keys, multiplex means for cyclically scanning the keys in succession from the high end of the keyboard to the low end thereof and producing on an output a time division multiplexed serial data stream comprising a plurality of time slots corresponding respectively to the keys of the keyboard and keydown signals in time slots corresponding respectively to actuated keys of the keyboard, tone producing means for generating tones and placing selected tones on an output, and demultiplex means synchronized with said multiplex means for demultiplexing time division multiplexed serial data on its input and controlling said tone producing means to place tones on its output selected in accordance with the time slot positions of keydown signals in the serial data on its input, the improvement being an automatic bass generator interposed between said multiplex means and said demultiplex means comprising: an input to which the serial data stream is connected, a bass output, means responsive to one or more keydown signals in said serial data stream on the bass generator input for generating only a single keydown signal on the bass generator output for each scan of the keyboard regardless of the number of keydown signals in said serial data stream wherein said single keydown signal is a fixed number of time slots after the last keydown signal in the serial data stream for that scan of the keyboard and occurs prior to the next scan of the keyboard, and means for connecting the bass output to said demultiplex means input.

4,350,070

ELECTRONIC MUSIC BOOK

Sohail E. Bahu, 50509 Hollyhock Rd., South Bend, Ind. 46637

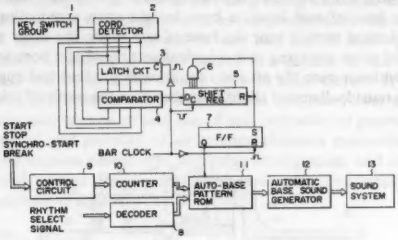
Filed Feb. 25, 1981, Ser. No. 238,005
Int. Cl.³ G09B *15/02*; G10H *1/40*
U.S. Cl. 84—1.03 **11 Claims**

1. A music book comprising a memory means for storing a plurality of electronically coded musical scores and for storing a list of song titles for said scores in alphabetical sequence together with a code reference for each title, means for translating and for displaying said coded musical scores and said song title and code list in readable forms, indexing means for selecting a single score from said plurality of stored electronically coded musical scores, said indexing means including an alphabetical keyboard for entering at least a portion of the title of a desired score as a memory recall command for said song title and code list and a code character keyboard for entering the code reference of the desired score, a central processing and data communications means interconnecting said memory, translating and display means and said keyboards for causing a display of song titles beginning with the letters entered through said alphabetical keyboard and for causing said desired score to be displayed in response to a code entry through said code character keyboard, and a power means for operating said aforementioned means.

4,350,071
AUTOMATIC ACCOMPANIMENT CIRCUIT

Nobuaki Kondo, Omiya, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Apr. 3, 1981, Ser. No. 250,851
Claims priority, application Japan, Apr. 19, 1980, 55/51988
Int. Cl.[3] G10H *1/40*
U.S. Cl. 84—1.03 2 Claims



1. An automatic accompaniment circuit comprising:

a code detector for scanning key switches to detect the code of a depressed one of the key switches;

a latch circuit for latching the output signal of the code detector by a bar clock pulse which is produced for each bar;

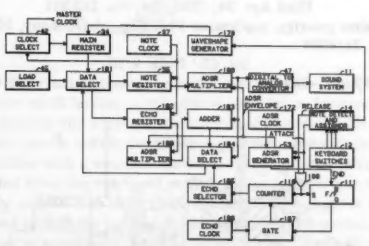
a comparator for comparing the output signals of the code detector and the latch circuit to yield a coincidence signal; and

control means for counting the coincidence signal from the comparator by a desired number of bars using the bar clock pulses and then providing a command signal for changing the pattern of an automatic accompaniment.

4,350,072
REENTRANT REVERBERATION GENERATOR FOR AN ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Apr. 24, 1981, Ser. No. 257,069
Int. Cl.[3] G10H *1/02*
U.S. Cl. 84—1.24 8 Claims



1. In combination with a musical instrument having a waveshape memory storing a plurality of waveshape data points corresponding to the amplitudes of a corresponding number of evenly spaced points defining a period of a musical signal and in which said data points are sequentially and repetitively read out of the waveshape memory and transferred to a digital-to-analog converter at a rate corresponding to the pitch of the musical note being generated, apparatus for producing a reverberation effect comprising;

an echo memory means for storing data to be thereafter read out,

a note clock for generating timing signals corresponding to the pitch of said generated musical note,

a first addressing means responsive to said timing signals whereby data is sequentially and repetitively read out of said echo memory means,

an adder means whereby data read out of said waveshape memory is added to data read out of said echo memory means to form an echo data set,

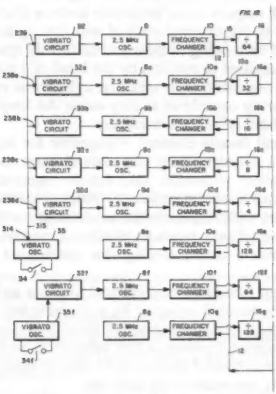
a first data select means for storing said echo data set in said waveshape memory thereby creating said reverberation effect, and

conversion means whereby data read out of said waveshape memory is converted to said musical signal.

4,350,073
HYBRID PIPE ORGAN WITH ELECTRONIC TONAL AUGMENTATION

Richard H. Peterson, 11748 Walnut Ridge Dr., Palos Park, Ill. 60464

Filed Sep. 23, 1980, Ser. No. 189,984
Int. Cl.[3] G10H *1/02*
U.S. Cl. 84—1.25 10 Claims



1. A tuning circuit for a hybrid organ having both wind and electronically generated tones, comprising:

a plurality of frequency synthesizers, each synthesizer producing a corresponding one of a plurality of octaves of electronically generated tones;

a master oscillator for each frequency synthesizer, all of said oscillators having the same nominal frequency of oscillation;

a frequency changer for each master oscillator, each frequency changer being capable fo varying the frequency of the output from its corresponding master oscillator;

means connecting the frequency-varied output of each said master oscillator to its corresponding frequency synthesizer; and

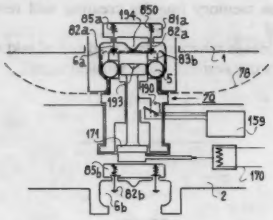
tuning control means connected in common to all of said frequency changers for simultaneously varying all of said frequency changers, whereby the outputs of all of said master oscillators can be simultaneously varied from their nominal frequencies to vary the pitches of the electronically generated tones produced by said frequency synthesizers.

4,350,074

MECHANICAL AND ELECTRICAL COUPLING DEVICE FOR CHARGES, PARTICULARLY MILITARY CHARGES

Jean P. Rouget, and Edmond Roustant, both of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed May 20, 1980, Ser. No. 151,587
Claims priority, application France, Jun. 7, 1979, 79 14591
Int. Cl.³ B64D 1/04; F41F 5/02
U.S. Cl. 89—1.5 D 3 Claims



1. A device for sequentially coupling and separating a plurality of projectiles carried under an aircraft, wherein said device comprises the following elements:

a male element associated with a projectile and engageable for snap-fastening by rotation within a corresponding female element placed on an adjacent projectile, said male element being provided with a first hollow cylindrical member which is capable of rotating about its longitudinal axis with respect to the projectile body, a plurality of balls inserted in the external wall of said first cylindrical member, said balls being disposed in uniformly spaced relation and maintained in position by the head of a piston internal to and concentric with said first cylindrical member, said piston being capable of sliding along the longitudinal axis of said first cylindrical member;

a cylindrical female element engageable for snap-fastening around a corresponding said male element and placed on the adjacent projectile, said female element being provided with a second hollow cylindrical member which is stationary with respect to the adjacent projectile body, the distal end of said second cylindrical member being provided with a snap-fastening rim interrupted by sockets; and

a plate fixed to said first cylindrical member and fitted with a locking member actuated by a movable key for rotating said first cylindrical member relative to said second cylindrical member between a first position in which said balls are released by said sockets and a second position in which said balls are retained by said rim.

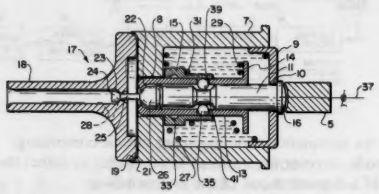
4,350,075

OMNI PULL PERCUSSION FIRING MECHANISM

Thomas V. Smith, Troy, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 25, 1980, Ser. No. 143,656
Int. Cl.³ F41F 13/04
U.S. Cl. 89—27 R 4 Claims

1. A percussion type firing mechanism adapted to actuate the firing pin of a large cannon, comprising; a generally cylindrical hammer aligned with said firing pin, said hammer having an annular groove just aft of its midpoint and a flange at its forward end, said hammer being slidably mounted in a bore in a cylindrical yoke, the portion of said hammer between said annular groove and said flange closely fitting said bore in said yoke and the portion of said hammer aft of said annular groove being of reduced diameter, a pair of cage holes in the sidewalls of said yoke at diametrically opposed points, a pair of balls held captive in said cage holes; said mechanism further comprising a generally cylindrical case with a central hole in the base or after end thereof, said hole being big enough to snugly accommodate the outside diameter of said yoke, said bore in said yoke tapering at its aft end to a spherical shape and communicating to a hole in said aft end, a pivot comprising a rod with large and small bulbous end portions, said large bulbous end portion being inserted into the aft end of said yoke and engaging said spherical shape, a lever comprising a circular base with a central upstanding stem integral therewith, having its base attached to the aft end of said case, said aft end of said case having a rim portion adapted to receive and contain said circular base of said lever, a bore in said stem terminating in a spherical section near the base of said lever, the other end of said pivot engaging said spherical section of said bore to hold said lever onto the aft end of said case; a cylindrical cup with an outside diameter slightly smaller than the inside of said case



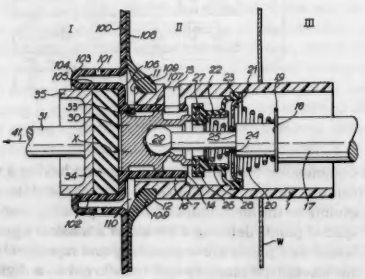
and a central hole in the forward end thereof with a diameter equal to that of said bore in said yoke, said cup being nested inside said case with the flanged head of said hammer projecting through the central hole therein, a cylindrical sleeve with a stepped outside diameter slidably mounted over said yoke, an annular groove on the inside of said sleeve near the aft thereof, three helical coil springs mounted within said case with their axes co-linear but with different turn diameters, the outmost of said springs being mounted between the inside of said cup and the base of said case, the intermediate spring being connected between a flange at the forward end of said yoke and the base of said case, and said innermost spring being connected between said stepped portion of said sleeve and said flange on said yoke.

4,350,076

VACUUM BRAKE BOOSTER

Rudolf Thiel, Frankfurt am Main, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Apr. 24, 1980, Ser. No. 143,251
Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918908
Int. Cl.³ F15B 9/10
U.S. Cl. 91—369 A 20 Claims



1. A vacuum booster comprising:

a low pressure housing having a longitudinal axis;

a rigid movable partition wall disposed in said housing coax-

ial of said axis to divide said housing into a vacuum chamber and a working chamber; and

a control hub disposed in said housing coaxial of said axis immovably connected to said partition wall, said control hub having a hollow interior chamber, a plurality of air guiding channels extending from said interior chamber to said vacuum chamber and said working chamber and a valve arrangement disposed in said interior chamber for controlling the air flow in said air guiding channels, said control hub including two tubes concentric with respect to each other and coaxial of said axis and at least one axially extending groove disposed in a portion of one of said two tubes sealed axially on both sides thereof by a wall of a portion of the other of said two tubes overlapping said portion of said one of said two tubes to provide one of said plurality of air guiding channels connecting said vacuum chamber to said valve arrangement, said one axial groove being coextensive with said overlapping portions of said two tubes.

4,350,077

DIFFERENTIAL PRESSURE OPERATED SERVO BOOSTERS

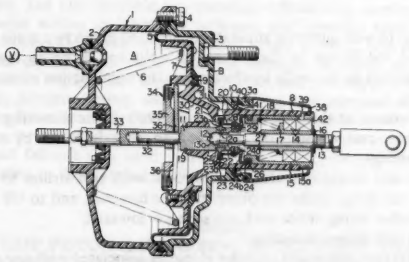
Hiroo Takeuchi, Asashina, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Jul. 23, 1980, Ser. No. 171,403

Claims priority, application Japan, Jul. 24, 1979, 54/102072[U]

Int. Cl.³ F15B *9/10*; F16J *11/02*

U.S. Cl. 91—376 R **1 Claim**



1. A differential pressure operated servo-booster comprising a booster shell having a cylindrical support, a forward first fluid chamber and a rearward second fluid chamber defined by a booster piston within the booster shell and normally in communication with a vacuum source, a valve cylinder integrally extended from the rearward surface of the booster piston and slidably received in the cylindrical support, a control valve received within the valve cylinder to permit the second fluid chamber to selectively communicate with the first fluid chamber or atmosphere, and an input rod extending through the valve cylinder and operatively connected to the control valve, the improvement comprising a plain bearing formed integral with the cylindrical support in a seamless fashion for slidably supporting the valve cylinder, and an annular recess in the inner surface of the cylindrical support for receiving a ring seal which seals between the cylindrical support and the valve cylinder, the booster shell, the cylindrical support and the plain bearing being integrally formed with each other from a synthetic resin, the valve cylinder being integrally formed with the booster piston from a synthetic resin having a hardness higher than the plain bearing.

4,350,078

APPARATUS FOR RESTRICTING THE VELOCITY OF A HYDRAULIC PISTON IN ITS END POSITIONS

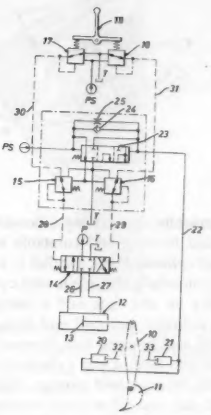
Bertil R. Olofsson, Eslöv, Sweden, assignor to Akermans Verkstad AB, Eslöv, Sweden

Filed Dec. 28, 1979, Ser. No. 108,084

Claims priority, application Sweden, Jan. 2, 1979, 7900014

Int. Cl.³ F15B *13/16*

U.S. Cl. 91—388 **3 Claims**



1. In a hydraulic excavator, an apparatus for restricting the movement of a piston of an operating hydraulic unit, when said piston approaches at least its one end position in a cylinder, comprising:

the operating hydraulic unit coupled between two excavator parts which are movable with respect to each other by means of the operating hydraulic unit;

a main valve which is coupled to the operating hydraulic unit in orner to be actuated by a first pressure medium supplied thereto;

a servo-circuit for regulating the main valve having an associated servo-pressure therein;

a hydraulic piston-cylinder sensor is secured to one of the excavator parts and has a freely projecting piston rod directed towards the second of the excavator parts; and

a pressure difference sensing valve which is coupled between said hydraulic piston-cylinder sensor and main valve;

a pressure provided in said hydraulic piston-cylinder sensor when the piston of the operating hydraulic unit approaches its end position, in that said piston rod of said hydraulic piston-cylinder sensor mounted on the one excavator part is actuated by the second excavator part, said pressure exceeds the servo-pressure, and said pressure difference sensing valve sensing the pressure difference between said pressure in said piston-cylinder sensor and the servo-pressure and, in accordance therewith, throttle valve means between said pressure difference sensing valve and main valve for throttling said first pressure medium supplied to the main valve such that a second pressure medium supplied the main valve to the operating hydraulic unit is throttled.

4,350,079

FLUID MOTOR

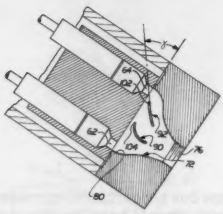
Hans-Dieter Drahtmüller, Aschaffenburg, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Feb. 29, 1980, Ser. No. 125,792

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, 2908119

Int. Cl.³ F01B *13/04*

U.S. Cl. 91—499 5 Claims



1. A fluid machine comprising a housing, a cylinder block disposed in said housing and rotatable about a first axis, a cylinder in said cylinder block parallel to and spaced from said first axis, a piston axially slidable in said cylinder, said cylinder block including an end face and a passage communicating between said cylinder and said end face, valve plate means connected with said housing and disposed in slidable engagement with said end face of said cylinder block for controlling of flow of fluid through said passage, said valve plate means including first and second arcuate openings concentric with said first axis, said arcuate openings being radially aligned with said passage in said cylinder block whereby fluid may flow between said passage and one or the other of said arcuate openings during the portion of the rotation of said cylinder block in which said passage overlaps with said opening, first and second channels in said valve plate means establishing fluid communication between the exterior of said housing and a respective one of said first and second arcuate openings, drive means for rotating said cylinder block and for effecting reciprocating motion of said piston in said cylinder at varying speeds to draw fluid into and expel fluid from said cylinder, and flow guiding means for guiding the flow of fluid through at least one of said channels to different portions of the one of said arcuate openings with which said one of said channels communicates according to the velocity of said piston as said passage rotates by a corresponding one of said arcuately extending portions of said arcuate opening, including at least one vane disposed in one of said channels in said valve plate means and adjacent said arcuately extending opening, said vane including a portion toward said end face of said cylinder block, said portion of said vane being inclined at an angle γ with a plane perpendicular to said first axis, wherein said angle γ satisfies the formula:

$$\tan \gamma = (R_{cyl}/R_v)k \text{ Sin } \alpha \text{ Sin } \phi$$

where:

R_{cyl} = radial distance between said first axis of rotation of said cylinder block and the center line of said cylinder;

R_v = the average radius of curvature of said arcuate openings in said valve plate means;

ϕ = the angular rotational position of said cylinder block with respect to a top dead center position of said piston in said cylinder;

α = the angle between said first axis and said second axis; and

k = a constant.

4,350,080

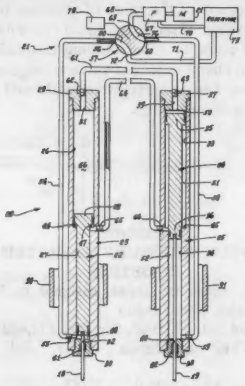
APPARATUS TO PUMP MULTIPLE WELLS

John S. Page, Jr., 21372 Brookhurst St., No. 312, Huntington Beach, Calif. 92646

Filed Dec. 16, 1980, Ser. No. 216,802

Int. Cl.³ F15B *11/16, 13/06*

U.S. Cl. 91—520 8 Claims



1. In well pumping apparatus adapted to pump two wells via two rod strings in the respective wells and pumping means operated in the wells by the strings, the combination comprising:

(a) means at the well surface operatively interconnecting the two rod strings for balancing loading imposed by said strings,

(b) said means operatively connected with said strings to lift one string while the other string is lowered, and to lift the other string while said one string is lowered,

(c) said means including

(x) first piston and cylinder elements associated with one rod string, one of said first elements being connectible with said first rod string, and

(y) second piston and cylinder elements associated with the other rod string, one of said second elements being connectible with the second rod string,

(d) said means including an hydraulic system interconnecting said first elements with said second elements so that hydraulic pressure acts alternately to lift one of the first elements and then one of the second elements, said means also including an hydraulic fluid pump connected with said hydraulic system via valving having one position in which pumped fluid pressure acts to elevate said one of the first elements, and another position in which pumped fluid pressure acts to elevate said one of the second elements, and said hydraulic system including

(i) primary ducting connected with said cylinder elements for alternately supplying fluid pressure to lower chambers defined by said piston and cylinder elements,

(ii) secondary ducting interconnecting upper chambers defined by said piston and cylinder elements, and

(iii) tertiary ducting interconnecting intermediate chambers defined by said piston and cylinder elements.

4,350,081

FAIL-SAFE DEVICE FOR ACTUATORS

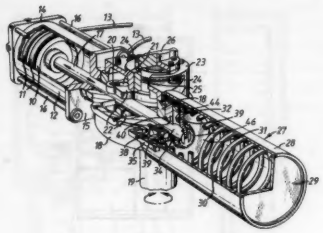
Jeremy J. Fry, and Christopher Warnett, both of Bath, England, assignors to Rotork Controls Limited, Bath, England

Filed Jul. 16, 1980, Ser. No. 169,454

Claims priority, application United Kingdom, Jul. 20, 1979, 7925443

Int. Cl.³ F01B *29/00, 21/00*

U.S. Cl. 92—128 8 Claims



1. An actuator comprising a piston and cylinder unit and means for flowing fluid under pressure into the cylinder to actuate the piston, a casing attached to said unit, an output member mounted in the casing, said piston having a piston rod attached thereto which extends through said casing and is operatively connected with said output member for actuating said output member in response to movement of said piston in said cylinder, and a fail-safe unit for returning said piston to a fail-safe position in said cylinder in the event of failure of the power supply to said cylinder, said fail-safe unit comprising a housing closed at one end and an opposite open end, a movable cap member disposed in said opposite end, a preloaded compression spring disposed in said housing between said closed end, and said movable cap member, a fixed ring member secured within said housing adjacent said opposite open end retaining the movable cap member in said housing, said piston rod extending through said ring member whereby an end thereof engages said cap member when said housing is fitted to the actuator casing, said actuator being characterized in that the fail-safe unit is detachably connected to said actuator casing by an attachment means which prevents disconnection of said fail-safe unit until said piston has been moved by said spring to its fail-safe position in said cylinder.

4,350,082

PUMP PISTON HAVING RING LUBRICATION MEANS

Donald E. Carrens, Tulsa, Okla., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 5, 1979, Ser. No. 17,755

Int. Cl.³ F01M *11/02;* F04B *17/00;* F16J *1/08*

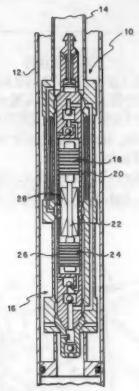
U.S. Cl. 92—159 5 Claims

1. In a downhole oil well pump apparatus having a reciprocating double acting piston assembly mounted within a bore, an improvement therein comprising:

(a) a generally cylindrical piston at each end of said bore with the outer cylindrical peripheral surface thereof slightly smaller than said bore, said piston having a first end portion open to hydraulic well power fluid to drive said piston and a second opposed end portion open to fluid to be pumped;

(b) a plurality of annular piston ring grooves around the outer periphery of said piston and opening to said outer cylindrical peripheral surface thereof, said piston ring groove including a main portion having an upper wall, a lower wall and a continuous inner wall arranged to provide a space of sufficient cross-section to loosely mount a piston ring, each said groove further including an auxiliary portion of a smaller width and depth than and connecting to said main portion, said auxiliary groove portion being located at one side of said groove main portion toward said first end portion of said piston, and opening substantially to said outer peripheral surface;

(c) a piston ring loosely mounted in said groove main portion and having upper and lower sides for abutting engagement with said upper and lower walls, respectively, for substantially blocking free flow of hydraulic power fluid flow therethrough during operation of said pump when said piston ring is displaced within said groove toward the



side thereof which does not have said auxiliary portion in order to permit hydraulic well power fluid to accumulate around said piston ring in order that said hydraulic well power fluid will provide lubrication for said upper and lower sides of said piston ring as it moves in said bore; and wherein said pump apparatus has one of said pistons mounted on each end of a pump rod, and said groove auxiliary portion of each piston is located on said one side of said main groove portion toward mutually facing end portions of said pistons.

4,350,083

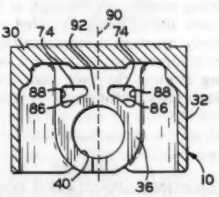
HEAT BARRIER FOR REFRIGERATION COMPRESSOR PISTON

Edwin L. Gannaway, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Sep. 29, 1980, Ser. No. 191,512

Int. Cl.³ F16J *1/00*

U.S. Cl. 92—238 8 Claims



1. A piston comprising: a head, a generally cylindrical piston skirt joined to said head and extending axially therefrom, a pair of aligned circular wrist pin holes extending through said skirt, and two heat barrier means in said piston skirt located between said head and the respective wrist pin holes for blocking a substantial portion of the heat conduction from the head to the respective wrist pin holes, each said heat barrier means comprising at least two openings extending completely through the piston skirt in close proximity to the respective wrist pin hole and on opposite sides in the circumferential direction of an

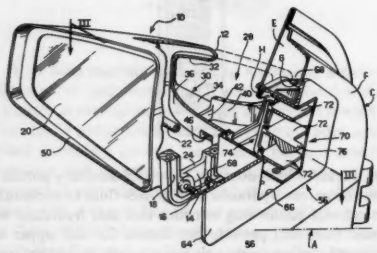
axial line intersecting the center of the respective wrist pin hole, each pair of said openings having at least a portion which is positioned axially between the respective wrist pin hole and the piston head, and the openings in each pair being separated by a narrow bridge of the piston skirt that lies along said axial line, said piston skirt including substantially opening-free heat conduction areas between said wrist pin holes and axially extending from the piston head down to an area beyond the wrist pin holes, whereby heat is channeled away from the piston head along a flow path circumferentially spaced from the wrist pin holes.

4,350,084

EXTERNAL REAR-VIEW MIRROR FOR MOTOR VEHICLES COMBINED WITH AN AIR INLET OPENING TO THE PASSENGER COMPARTMENT

Roberto Azzola, Turin, Italy, assignor to Saiag S.p.A. Industria Articoli Gomma, Turin, Italy

Filed Nov. 7, 1980, Ser. No. 205,023
Int. Cl.³ B60H *1/24*
U.S. Cl. 98—2 **8 Claims**



1. An external rear-view mirror for a motor vehicle, said mirror comprising:

a fairing in the shape of a half-shell defining an opening intended to face rearwardly with respect to the direction of travel, said half-shell including a back wall intended to face forwardly with respect to said direction of travel and a lateral wall constituting a fixing flange for fixing to an outer wall of the body of a vehicle,

a reflective plate adjustably mounted in said opening of the fairing,

a structure provided within said fairing and defining an elbow-shaped duct having an inlet situated in the said back wall which acts as an intake for external air, the duct extending into the said fixing flange, and

an outlet fitting terminating the duct at its end remote from its inlet, said fitting being intended to be mounted in a vehicle-body aperture communicating with the vehicle passenger compartment, to act as a ventilation outlet for air passing through the duct, said fitting being provided with a shutter device for controlling air flow through the duct.

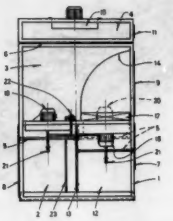
4,350,085

AIR CONDITIONING APPARATUS FOR FARMING AND ANIMAL HUSBANDRY ACTIVITIES INDUSTRIAL FACILITIES AND WELL-BEING IN GENERAL

Ricardo B. Lis, Riera, 8 - San Cugat del Valles, Province of Barcelona, Spain

Filed Dec. 18, 1980, Ser. No. 217,997
Claims priority, application Spain, Jan. 8, 1980, 487.513
Int. Cl.³ G03F *7/02*
U.S. Cl. 98—33 A **12 Claims**

1. An air conditioning apparatus for use in industrial facilities such as farming, animal husbandry, or the like, comprising a housing bounded by external walls and having a top, said housing being subdivided into a bottom compartment, a middle compartment and a top compartment by partitions spaced from one another along the height of said housing, each of said compartments including at least one opening formed on the respective external wall; and a number of fans located in said housing and provided with humidifying means, a least one of said fans being provided with a heating unit; electrical means mounted outside of said housing and operatively connected to said fans, said fans being electrically controlled by said electrical means so as to create a first air flow which is drawn in and



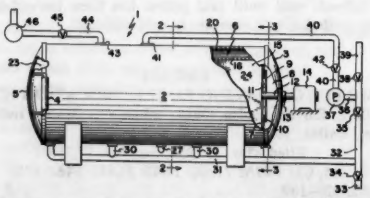
expelled from the apparatus through said top compartment for extracting of foul and toxic air from an enclosed room in which the apparatus may be positioned, a second air flow which enters said housing thrugh one of said openings, circulates within said housing in closed circuit and leaves said housing in warmed or condition, and a third air flow which enters said housing from atmosphere through one of said openings and leaves said housing through another of said openings for renewal air in the enclosed room.

4,350,086

COOKING OF FOODSTUFFS

Clifford C. Wetzel, Rte. 2, Ithaca, Mich. 48847

Continuation-in-part of Ser. No. 57,269, Jul. 13, 1979, abandoned. This application Jul. 7, 1980, Ser. No. 166,069
Int. Cl.³ A47J *27/04*
U.S. Cl. 99—368 **14 Claims**



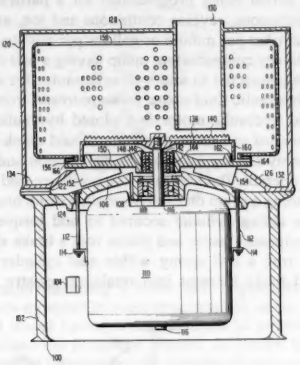
1. A pressure retort construction comprising a hollow vessel closed at one end and open at its other end; closure means at said other end for selectively opening and closing the latter; a walled, hollow housing accommodated in said vessel, said housing having its walls spaced from said vessel to form passages between said housing and said vessel, said housing being open at one end and having an end wall at its opposite end, said end wall having an opening therein; means for introducing a fluid heating medium into said vessel; circulating means occupying the opening in said housing end wall; means for driving said circulating means in a direction to circulate said heating medium from one end of said vessel to the other end through said housing and from said other end of said vessel to its said one end through said passages; foodstuff supporting means removably accommodated in said housing and being open in directions fore and aft of said housing; and means for effecting a seal between said supporting means and at least two walls of said housing.

4,350,087

JUICER HAVING IMPROVED BALANCE

Justo D. Ramirez, Calle-Garibaldi #1385 S.H., Guadalajara, Jalisco, Mexico

Filed Mar. 20, 1981, Ser. No. 245,869
Claims priority, application Mexico, Mar. 26, 1981, 181717
Int. Cl.[3] A23N *1/02*
U.S. Cl. 99—511 4 Claims



1. A juicer for separating a liquid portion of a product from its solid portions comprising:

a base,

a motor means mounted on the base for rotating a spindle,

a cutting disk rigidly mounted on the spindle for positive rotation thereby,

means for introducing the product to be juiced to the cutting disk,

a centrifuging disk mounted for independent rotation on the spindle between the motor and the cutting disk by means of ballbearings on the spindle,

means mounted on the centrifuging disk for retaining the solid portions of the product and for allowing the liquid portion to pass radially outwardly, and

a collection means surrounding the retaining means for collecting the liquid portion,

whereby the motor means can rotate the cutting disk and the friction of the ballbearings will cause the centrifuging disk to rotate at a rotational speed different from that of the cutting disk to result in a relative rotational speed between the cutting disk and the centrifuging disk.

4,350,088

COCONUT SHREDDER AND CUTTER APPLIANCE

Jose V. Rubio, Jr., 6814 Hague Ave., Cleveland, Ohio 44102

Filed Oct. 27, 1980, Ser. No. 201,294
Int. Cl.[3] A23N *5/03*
U.S. Cl. 99—538 15 Claims

1. A compact appliance for removing coconut meat from a coconut half section, comprising:

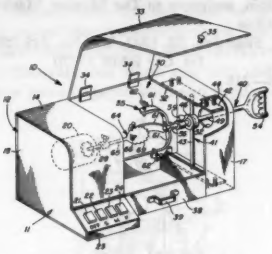
a housing having a shredding compartment therein and cover means for opening and closing said compartment;

a shredder blade located in said compartment;

means for mounting said blade in said housing and for rotating said blade about an axis;

coconut shell holder means for holding the coconut half section in said compartment;

and means for mounting and manually manipulating said holder means for both axial and universal pivotal movement with respect to said axis, whereby the coconut shell half section can be moved universally with respect to said blade to bring portions of the meat in the coconut half section progressively into engagement with the blade for effecting removal of the meat from the shell, said means for mounting and manually manipulating including a



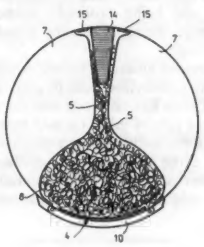
spherical bearing permitting the aforementioned universal pivotal movement of said holder means.

4,350,089

FRUIT JUICE PRESS

Oskar Braun, Lindenfels, Fed. Rep. of Germany, assignor to Josef Willmes GmbH, Bensheim, Fed. Rep. of Germany

Filed Oct. 31, 1980, Ser. No. 202,644
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945254
Int. Cl.[3] B30B *5/02, 9/22*
U.S. Cl. 100—116 9 Claims



1. A press for squeezing juice-containing materials, like grapes, fruit-mashes and the like, by a closed container rotatable around a horizontal, longitudinal axis, a filling opening being provided in the jacket of the container, a pressure membrane made of flexible or elastic material being provided inside the container and fastened parallel to a vertical plane passing through the axis of rotation, said membrane dividing the interior of the container into an outer pressure-medium space and an inner squeeze space, characterized in that:

(a) there is a filling opening (4) in the container covered by a perforated sheet (9) to serve as a juice-draining means,

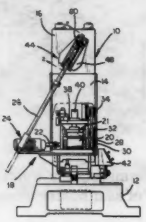
(b) that an elongated loosening and draining device (14) is positioned in the squeeze space (8) opposite the filling space and opposing the pressure membrane, and

(c) that the pressure membrane (5) is tightly fastened to the opposite edges of the filling opening (4) and on opposite sides of the loosening and draining device (14).

4,350,090
MOTORIZED AND MICRO FEED LENGTH ADJUSTMENT FOR A PRESS FEED

Vernon E. Busse, Minster, and Robert L. Schockman, St. Henry, both of Ohio, assignors to The Minster Machine Company, Minster, Ohio

Filed Jan. 30, 1981, Ser. No. 229,789
Int. Cl.³ B30B *15/30*
U.S. Cl. 100—216 **14 Claims**



1. In a feed apparatus for a press including a connecting rod and at least one feed roll driven by the connecting rod, a feed length adjustment mechanism for reciprocating said connecting rod comprising:

a hub member adapted to be connected to a rotating shaft in a press and rotated about an axis,

a block connected to said hub member and having a slideway therein,

a slide received in said slideway for sliding movement in a direction transverse to the axis of rotation of the hub member,

means for rotatably connecting said slide to said connecting rod,

lock means for locking said slide to said block comprising a cylinder in said slide having a lock piston mechanism therein and a fluid inlet means for pressurizing the cylinder and locking said piston mechanism against said block,

a lead screw threadedly connected to said slide,

a bidirectional fluid motor means mounted to the adjustment mechanism and being drivingly connected to said lead screw to rotate the same thereby translating said slide in said block, and

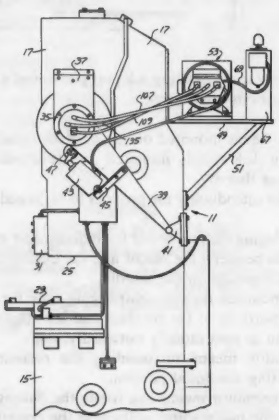
a fluid union means mounted to said adjustment mechanism for supplying pressurized fluid to said cylinder inlet means to lock said slide to said block and for supplying pressurized fluid to a pair of inlets on said motor means to rotate the motor means in either direction, said fluid union means comprising three fluid passages contained in a rotatable inner member and three fluid conduits connecting said passages to said cylinder and motor means inlets, respectively.

4,350,091
CRANK PRESS WITH HYDRAULIC TRANSMISSION

J. Edgar Myles, Bloomfield, Mich., assignor to J. E. Myles, Inc., Troy, Mich.

Filed Jan. 15, 1980, Ser. No. 112,375
Int. Cl.³ B30B *1/26, 15/16*
U.S. Cl. 100—271 **5 Claims**

1. In a crank press having a base, pedestal, a rotatable elongated crank shaft having an axis journaled thereon for controlling reciprocal movement of a top platen guidably mounted upon said pedestal for the formation of work pieces supported on a stationary bottom platen; the improvement comprising a rotary hydraulic motor mounted on said pedestal having a reversible drive shaft connected to and longitudinally aligned with said crank shaft for rotation in unison about the same axis; a torque arm connecting said rotary hydraulic motor to said pedestal; a hydrostatic control transmission mounted on said pedestal and connected to said motor; said transmission comprising a fluid reservoir, a hydraulic pump assembly including a main variable delivery compensating pump and a charge pump, said charge pump connected to said reservoir and having an output conduit connected to a servo directional valve, said directional valve being connected to said main pump by a pair of separately operable output conduits for providing a predetermined pilot pressure to displacement servo controls for selectively controlling its operating mode, forward and reverse, an electronic driver connected to said directional valve, said driver being programmed for a particular mode, forward continuous, reverse continuous and jog, at a certain number of strokes per minute or gallons per minute; said main variable delivery compensating pump having a pair of pressure fluid outlets connected to said hydraulic motor for selectively delivering hydraulic fluid under pressure to and from opposite sides of said hydraulic motor in a closed hydraulic loop for selective forward and reverse rotation of said crank shaft; said pump assembly having a neutral mode position and a pair of alternately operable fluid motor drive positions; said hydraulic motor including a drum on its drive shaft; a drum brake including a single acting cylinder secured to said torque arm and having a reciprocal piston and piston rod; a brake element on said piston rod; a coil spring within said cylinder normally biasing said brake element into retaining registry with said



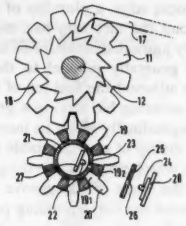
drum when the pump assembly is in a neutral mode; and a pressure conduit interconnecting said cylinder an pump assembly adapted for transmitting pressure fluid to said cylinder when said pump assembly is in one of its operating modes, to retract said brake element; said main pump having a drive shaft, a rotary variable differential transducer connected to said drive shaft, and a transmission receiver connected to said servo valve and its electronic driver; and a circuit between said transducer and said receiver providing a feedback signal to said servo valve until said pump reaches the preselected mode for closing the hydraulic loop between said servo valve and main pump; an electric motor connected to a power source and to said charge pump and main pump, and a safety circuit including a normally open electronic valve connected into the charge pump conduit, adapted in one position to drain pressure fluid to said reservoir, to deactivate said hydraulic motor; and an electric connection between said electric motor and electronic valve for maintaining said valve in a closed position while said electric motor is energized; and said hydrostatic transmission including a primary relief valve preset for the maximum operating pressure of the system; a conduit interconnecting the main pump and said relief valve, and an electronic controller connected to said primary relief valve for controlling its pressure setting.

4,350,092

PARALLEL-WHEEL PRINTERS

Christian Geney, Clichy, France, assignor to SMH-Adrex, Paris, France

Filed May 19, 1980, Ser. No. 150,906
Claims priority, application France, May 28, 1979, 79 13444
Int. Cl.³ B41J *1/44*
U.S. Cl. 101—99 6 Claims



1. A printer including a drive shaft, a plurality of parallel print wheels mounted in overriding relation on the drive shaft; each print wheel having a multiplicity k of printing positions spaced around the periphery thereof; individual electro-magnet latch means for stopping the rotation of each print wheel at an ordered printing position; means for controlling each latch means to stop its corresponding print wheel in response to an order signal; means for sensing angular positions of the drive shaft corresponding to each printing position of the print wheels; a plurality of parallel auxiliary wheels; means for mounting each auxiliary wheel for rotation about an axis parallel with the drive shaft and in meshing engagement with a corresponding print wheel; means for detecting angular positions of each auxiliary wheel corresponding to the printing positions of its print wheel; and means for comparing the detected angular position of each auxiliary wheel after actuation of the latch means of its associated print wheel with the print wheel position order signal, wherein said means for detecting the angular position of the auxiliary wheels comprises:

a fixed tubular shaft parallel to the drive shaft and rotatably supporting the auxiliary wheels, said tubular shaft having a plurality of axially-spaced radial apertures, one aperture for each auxiliary wheel;

a plurality of radiation emitters disposed inside said tubular shaft in alignment with said apertures;

a plurality of receivers sensitive to the radiation from said emitters, each receiver being disposed outside an auxiliary wheel in alignment with a respective aperture and emitter; and

each auxiliary wheel having a plurality of angularly spaced circumferential portions which are opaque to radiation from said emitters alternating with an equal plurality of portions which are transparent to said radiation, one of the plurality of either said opaque or transparent portions being in registry with the line between the respective emitter and receiver when the corresponding print wheel is stopped at each printing position.

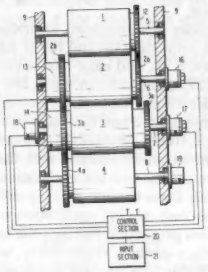
4,350,093

IMAGE POSITION ADJUSTING DEVICE FOR PRINTING MACHINE

Koji Ishii, Fuchu, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed Dec. 3, 1980, Ser. No. 212,377
Claims priority, application Japan, Dec. 5, 1979, 54-158527
Int. Cl.³ B41F *5/02, 5/22, 13/12*
U.S. Cl. 101—217 3 Claims

1. A printing machine for printing on both sides of a printing sheet comprising: a first plate cylinder mounted for rotation on a first shaft and having a first gear coupled thereto; a first rubber cylinder mounted for rotation on a second shaft and having a second gear rigidly secured to said second shaft and engaged with said first gear; a first electromagnetic clutch and third gear, said first electromagnetic clutch being operatively mounted to engage and disengage said third gear with said second shaft; a second rubber cylinder mounted for rotation on a third shaft; a second electromagnetic clutch and fourth gear, said second electromagnetic clutch being operatively mounted to engage and disengage said fourth gear with said third shaft, said fourth gear being engaged with said third gear; first and



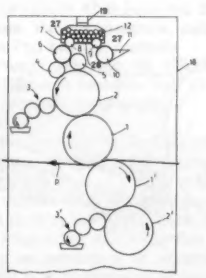
second electromagnetic brakes, said first electromagnetic brake being operatively coupled to said second shaft and said second electromagnetic brake being operatively coupled to said third shaft; a second plate cylinder mounted for rotation on a fourth shaft and having a fifth gear fixedly secured to said fourth shaft which is engaged with said fourth gear; first and second rotational angle detectors coupled to operate in response to angular positions of said third and fourth shafts, respectively; an electric motor; and a third electromagnetic clutch operatively coupling said motor to said third gear.

4,350,094

INK TRANSFER APPARATUS FOR ROTARY OFFSET PRINTING MACHINES

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Sep. 12, 1980, Ser. No. 186,531
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1979, 2942689
The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.
Int. Cl.³ B41F *31/14, 31/26*
U.S. Cl. 101—350 10 Claims



1. Ink transfer apparatus for a rotary offset printing machine having a plate cylinder (2) to apply ink to the plate cylinder of the machine,

said ink transfer apparatus consisting of

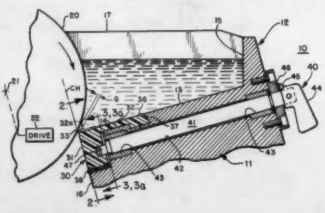
means (11) for furnishing printing ink;
an ink pick-up roller (10) receiving ink from the ink furnishing means;
at least one ink application roller (4, 5, 6) applying ink to the plate cylinder of the printing machine and being driven at about the same circumferential speed as the plate cylinder,
said at least one ink application roller being spaced from and out of driving contact with said ink pick-up roller (10);
and an ink roller train bridging the gap between said ink pick-up roller (10) and said at least one ink application roller, said ink roller train comprising, in accordance with the invention,
a cage-like holder (7) positioned to bridge the gap between the ink pick-up roller (10) and the at least one ink application roller (4, 5, 6), said cage-like holder having confining end walls (27) and a bottom wall (28);
two ink transferring rollers (8, 9) having an ink accepting surface projecting from the cage-like holder and positioned respectively, in surface engagement and in frictional rotation transfer relation with the ink pick-up roller (10) and the at least one ink application roller (4, 5, 6) for receiving ink from the ink pick-up roller, and providing ink to the at least one ink application roller, the ink transferring rollers projecting through the bottom wall (28) for driving surface contact, respectively, with the ink pick-up roller and the at least one ink application roller;
and a plurality of loose roller elements (12) freely, centerless floatingly located in the cage-like holder (7) for centerless, self-positioned rolling movement between the confining walls and the bottom wall of the cage, some of the roller elements being in surface engagement with said ink transferring rollers (8,9) and some of the roller elements (12) being in surface engagement with each other to increase the surface area of ink being transported within the ink train,
the plurality of roller elements (12) being of such number that the distance within the cage-like holder (7) between the ink transferring rollers (8, 9) is spanned by at least some of the roller elements (12) and which will assume positions between the ink transferring rollers, the plurality of roller elements being rotated by surface frictional engagement with the ink transferring rollers (8, 9).

4,350,095

INK FOUNTAIN ON INKING UNITS OF PRINTING PRESSES

Claus Simeth, Offenbach am Main, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 26, 1981, Ser. No. 277,954
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024453
Int. Cl.[3] B41F *31/04, 31/06*
U.S. Cl. 101—365 11 Claims



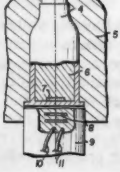
1. In an ink fountain for a printing press, the combination comprising a frame including a trough, a fountain roller journaled in the frame, the trough and the fountain roller together defining an ink space, means for rotating the fountain roller slowly in the direction of the bottom of the trough, the bottom surface of the trough having a recess along its presented edge which is below the axis of rotation of the fountain roller and which defines a downwardly spaced ledge surface on the frame, a metering bar formed of durable resilient plastic of "L" shaped cross section having integral first and second legs, the first leg occupying the recess with the corner of the "L" closely spaced parallel to the surface of the fountain roller to form a metering edge defining a gap, the second leg overlapping the bottom of the trough and secured to the bottom of the trough along its remote edge, a plurality of adjusting keys at spaced intervals along the metering bar, each key having a rotatable stem snugly journaled in the frame and which extends through the frame generally parallel to the bottom of the trough to a position adjacent the first leg of the metering bar, the first leg of the metering bar having a groove of constant width extending longitudinally along its inner wall parallel to the fountain roller, the tip of each rotatable stem being in the form of an eccentric which projects into the groove and which is closely fitted to the walls of the groove so that when an adjusting key is rotated the corresponding portion of the metering edge moves chordwise with respect to the fountain roller for localized adjustment of the width of the gap, and a resilient sealing strip interposed between the ledge surface and the first leg of the metering bar to follow the adjusting movement of the latter while sealing the metering bar with respect to the frame.

4,350,096

ELECTRIC DEVICE FOR THE IGNITION BY MAGNETIC INDUCTION OF A PYROTECHNIC SUBSTANCE

Christian G. Cannavo; Georges Cousin; Andre Espagnacq; Jacques X. Frayssac, all of Bourges; Loic Y. Laine, Saint-Doulchard; Daniel J. Midrouillet; Andre M. Pintenat, both of Bourges, and Jean B. Reboux, Savigny-sur-Orge, all of France, assignors to Etat Francais represente par le Delegation General pour l'Armement, Paris, France

Filed Oct. 15, 1979, Ser. No. 84,882
Claims priority, application France, Oct. 13, 1978, 78 29209
Int. Cl.[3] F42B *5/08, 9/08*
U.S. Cl. 102—209 12 Claims

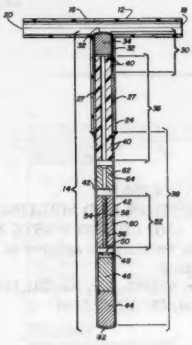


1. An electric magnetic induction ignition device for a pyrotechnic substance to be ignited by means of a weapon, comprising an induced member arranged in contact with the pyrotechnic substance, an inductor connected to a current generator and located opposite the induced member and coupled electromagnetically to it, said inductor located in a cavity open to electromagnetic radiations produced in the breech of said weapon, the induced member being formed of at least one open turn made of a material of high specific conductivity, at least one resistive element terminating the opening of each of said turns, the impedance of said turn being substantially the same as the impedance of said terminating element.

4,350,097
NONELECTRIC DELAY DETONATOR WITH TUBULAR CONNECTING ARRANGEMENT

Arthur F. Bowman, Tamaqua, and David G. Borg, Allentown, both of Pa., assignors to Atlas Powder Company, Dallas, Tex.

Filed May 19, 1980, Ser. No. 150,817
Int. Cl.³ C06C *5/04*
U.S. Cl. 102—275.2 **24 Claims**



1. A device for securing and aligning a detonator cord and a nonelectric detonator in initiating relationship relative to each other comprising:

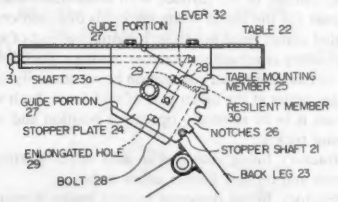
(a) a first tube open at both ends and dimensioned for receiving the detonator cord therein; and

(b) a second tube open at both ends, the first end of said second tube being joined to the wall of said first tube, and communicating with the interior of said first tube, said second tube dimensioned to allow frictional engagement of the nonelectric delay detonator therein when the nonelectric detonator is adjacent the location where said second tube is joined to said first tube so that the nonelectric detonator can be positioned adjacent the detonator cord to allow initiation of the delay detonator by the detonator cord.

4,350,098
TEST RACK FOR ELECTRONIC EQUIPMENT

Junkichi Shirono, and Katsuhisa Honda, both of Tokyo, Japan, assignors to Anritsu Electric Company Limited, Tokyo, Japan

Filed Jun. 16, 1980, Ser. No. 159,882
Claims priority, application Japan, Jun. 20, 1979, 54-76737
Int. Cl.³ A47F *5/12*
U.S. Cl. 108—6 **2 Claims**



1. A test rack for electronic equipment comprising:

a main shaft having leg portions;

a table pivotally mounted on said main shaft; and

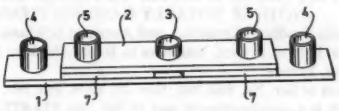
a table inclination mechanism for inclining the table at a desired angle and securing the table at the desired angle;

said table inclination mechanism including a table mounting member rotatably supported by said main shaft and fixedly mounted on a lower side of said table in a plane at right angles to said main shaft, said table mounting member including first and second guide portions spaced from said main shaft and extending parallel to one another at a sufficient length, each of said guide portions being inclined at a predetermined angle relative to the plane of said table, a stopper shaft provided on said legs so as to lie in parallel with said main shaft, and a stopper plate including a plurality of notches along one edge aligned on a circle whose central point lies on a central axis of said main shaft for engaging with said stopper shaft and carried by said table mounting member in a plane perpendicular to said main shaft, said stopper plate being slidably guided by said first and second guide portions of said table mounting member along a path parallel to said predetermined angle relative to said table whereby selected one of said notches engages with said stopper shaft and a unitary structure of said stopper plate, said table mounting member and said table can be inclined around said main shaft when said stopper plate disengages from said stopper shaft, and means for sliding said stopper plate relative to said stopper shaft.

4,350,099
CARGO PALLET

Nils G. W. Persson, Ljungsbro, Sweden, assignor to Nilssuns Industriemballage AB, Ljungsbro, Sweden

Filed May 22, 1980, Ser. No. 152,175
Claims priority, application Sweden, Jan. 6, 1979, 7904847; Jun. 7, 1979, 7905923
Int. Cl.³ B65D *19/26, 19/06*
U.S. Cl. 108—56.1 **4 Claims**



1. A cargo pallet for the transport of containers comprising first and second struts, each strut being provided with a plurality of blocks and pivotable relative to each other, the block which is arranged at the center of said first strut having an external cylindrical form and serving as the bearing pin when said first and second struts are pivoted from one position to another position, said second strut being provided with a transverse groove and an aperture located in the groove for receiving said central block, said transverse groove housing and fixing said first strut with said central block of said pallet in the operating position.

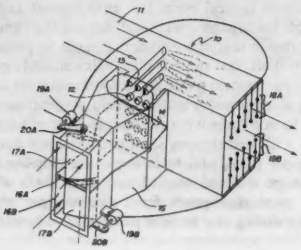
4,350,100
AIR INFILTRATION AND MIXING DEVICE

Robert G. Stephenson, Panania, Australia, assignor to James Howden Australia Pty. Limited, Australia

Filed Nov. 7, 1980, Ser. No. 204,935
Claims priority, application Australia, Nov. 13, 1979, PE1300
Int. Cl.³ F23J *15/00*
U.S. Cl. 110—203 **5 Claims**

1. An air infiltration and mixing device comprising a first duct adapted to carry a gas at an elevated temperature and a plurality of further ducts, each of significantly smaller cross sectional area than the first duct, extending into the first duct through a side wall thereof, the further ducts each extending transversely of the longitudinal axis of the first duct and each further duct having an aperture at or adjacent its free end opening substantially in a downstream direction of the first duct, the other end of each of the further ducts having an opening adapted to communicate with a source of air at a temperature lower than that of the said gas to be conveyed through the first duct, the plurality of said further ducts being divided into at least two arrays of further ducts each of which

arrays communicates with the said air source through a variable aperture damper and the further ducts in each array opening into a discrete zone of the cross sectional area of the first duct, at least two grids of the thermocouples located in the first duct downstream of the further ducts, each grid being disposed



within a zone in the first duct corresponding to one of the discrete zones into which one of the arrays of further ducts opens, and actuator means to open and close each of the dampers individually in accordance with a signal received from the corresponding grid of thermocouples.

4,350,101

DEVICE FOR TREATING SUBSTANCES IN DIFFERENT PHASES, SUCH AS THE TREATMENT OF SUBSTANCES IN LIQUID, SEMI-LIQUID OR PASTE FORM, BY ANOTHER NOTABLY GASEOUS PHASE

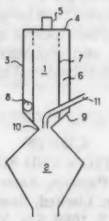
Francois Prudhon, Versailles, and Augustin Scicluna, Aubervilliers, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Division of Ser. No. 963,768, Nov. 27, 1978, Pat. No. 4,257,339, which is a continuation-in-part of Ser. No. 916,477, Jun. 19, 1977, which is a continuation of Ser. No. 770,802, Feb. 27, 1977, abandoned, which is a continuation of Ser. No. 479,774, Jun. 13, 1974, abandoned. This application Jul. 11, 1980, Ser. No. 168,657

Claims priority, application France, Jun. 20, 1974, 74 22620

Int. Cl.³ F23G *5/00*

U.S. Cl. 110—238 **8 Claims**



1. A device for treating substances in a liquid, semi-liquid, paste or solid phase by means of another, preferably gaseous phase, with or without entrained solid materials comprising:

(a) an outer casing with a surface of revolution defining a reaction chamber having a confined passage at one end;

(b) a perforated wall within the outer casing defining an annulus therebetween;

(c) a tangential supply pipe communicating with the annulus for introduction of a gaseous phase for helicoidal flow in said annulus and through the perforated wall into the interior of the reaction chamber;

(d) axial injection means in the end of the outer casing opposite the confined passage for introducing a part of the substance axially into the casing;

(e) a contact chamber which extends as a continuation of the outer casing with the confined passage therebetween; and

(f) coaxial injection means having an outlet end within the confined passage for introduction of at least one substance to be treated into the contact chamber in which treatment of the material passing through the confined passage takes place.

4,350,102

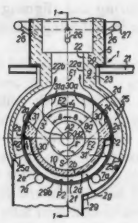
COMBINED COMBUSTION AND MELTING FURNACE FOR SOLID, PASTY AND LIQUID WASTE MATERIALS

Hans Ruegg, Wettingen, Switzerland, assignor to Von Roll AG, Gerlafingen, Switzerland

Filed Mar. 6, 1981, Ser. No. 241,116

Int. Cl.³ F23G *5/06*

U.S. Cl. 110—246 **8 Claims**



1. A combined combustion and melting furnace for solid, pasty and liquid waste materials comprising:

a drum rotatable on rollers about a longitudinal axis from a normally operative position and being adapted to be rocked about said longitudinal axis by a drive means, the waste material to be burned in said drum being stirred by the rocking motion, said drum having an upper portion and a lower portion;

a charging mechanism arranged outside a rear longitudinal end wall of said drum, said drum having a charging opening for the batchwise charging, by means of said charging mechanism, of the furnace with solid waste materials;

a burner for the liquid waste materials disposed on a burner anted amber fixed at a front longitudinal end of said drum;

a secondary combustion chamber having a gas inlet disposed at its base, said inlet connection being normally coupled to a gas outlet at the upper side of said drum, both when said drum is in its normally operative position and when it is being rocked;

a refractory lining disposed in said upper portion of said drum and on said burner anted amber;

a refractory lining disposed in said lower portion of said drum;

stationary water spray nozzles positioned outside said lower portion of said drum and being directed against the periphery of said drum; and

a water-filled granulating tank positioned below said drum to which molten combustion residues are removed from said drum, said drum being selectively rotated by approximately 180° from its normally operative position so that the molten residues discharge through said gas outlet into said granulating tank.

4,350,103

METHOD AND APPARATUS FOR THE COMBUSTION OF SOLID FUEL

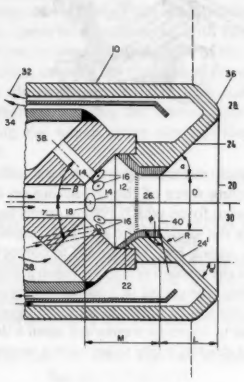
Ian Poll, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 26, 1980, Ser. No. 191,312

Claims priority, application United Kingdom, Oct. 2, 1979, 7934174

Int. Cl.³ F23D 1/02

U.S. Cl. 110—264 9 Claims



1. A process for the gasification of a solid particulate fuel by partial combustion, which comprises the steps of:

injecting into a pre-mix zone along a central flow axis a stream of transfer fluid having the particulate fuel disposed therein to form a central flow stream;

impinging a plurality of primary oxygen containing streams upon the central stream of transfer fluid having the particulate fuel disposed therein at an angle in the range of 30° to 60° relative to the central flow axis and having a velocity exceeding the velocity of the central stream; and

injecting a plurality of secondary oxygen containing gas streams into the pre-mix zone at a velocity in excess of the fuel stream for forming a shroud around the central stream as the mixture of fuel and gas streams flow from the pre-mix zone through a converging-diverging nozzle having a throat section into a combustion zone.

4,350,104

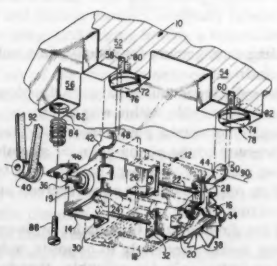
SEWING MACHINE MOTOR MOUNT

Albert N. Cook, Madison, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Oct. 15, 1981, Ser. No. 311,689

Int. Cl.³ D05B 69/02, 69/12

U.S. Cl. 112—220 9 Claims



1. In a sewing machine, an electric motor including sheet metal end brackets with integral parallel arms each of which has a circularly shaped disc like end portion thereon, a frame extending over the motor and including slots for the disc like end portions of the bracket arms, means on the frame confining said disc like end portions in the said slots for pivotal movement about an axis extending through the disc like end portions of the bracket arms, a power transmission belt in the machine drivable by the motor, and means for moving said end brackets and thereby the motor about said axis to effect a tension adjustment in the belt.

4,350,105

SEWING MACHINE WITH A DEVICE FOR LUBRICATING THE LOOPER

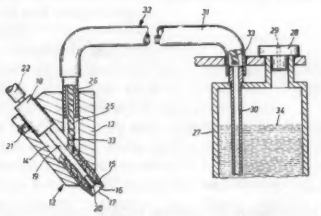
Ernst Albrecht, Hochspeyer; Reiner Hensel, Trippstadt; Karl-Heinz Keller, and Horst Stahlschmitt, both of Kaiserslautern, all of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Jul. 3, 1980, Ser. No. 165,615

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1979, 2928077

Int. Cl.³ D05B 71/02

U.S. Cl. 112—256 8 Claims



1. An improved device for lubricating a looptaker of a sewing machine, comprising a storage vessel for containing a supply of oil, an injection nozzle having a mixing chamber for mixing a gas and the oil to form an oil mist and a discharge opening communicating with said chamber for passing the oil mist to the looptaker, an oil line having a bore extending therethrough from an inlet submerged within the supply of oil to an outlet in fluid communication with said mixing chamber, capillary means mounted within said bore coextensive over a zone of said oil line from a distance spaced from said inlet and the oil of the storage vessel and having an end portion protruding through said outlet into said mixing chamber, and means for intermittently injecting the gas under pressure into said mixing chamber such that a pressure gradient is created between said inlet and said outlet of said oil line and oil is passed into said oil line.

4,350,106

TUFTED PILE FABRIC

Juel T. Hash, Ft. Oglethorpe, Ga., assignor to Shirley M. Jorges, Ft. Oglethorpe, Ga., a part interest

Division of Ser. No. 123,913, Feb. 22, 1980, abandoned. This application Jun. 3, 1981, Ser. No. 269,793

Int. Cl.³ D05C 17/02

U.S. Cl. 112—410 4 Claims

1. A tufted pile fabric comprising a base fabric having a plurality of longitudinal rows of pile yarn loops penetrating the base fabric and extending from one surface thereof, the loops of each row comprising a single yarn extending from substantially aligned penetrations of the base fabric, each loop extending through a first adjacent loop and is concatenated about a

second adjacent loop in the same longitudinal row, each loop lying substantially in the plane of said surface, and a backstitch

formed between adjacent loops of the same row lying substantially in the plane of the other surface.

4,350,107

AIR CUSHION VEHICLE

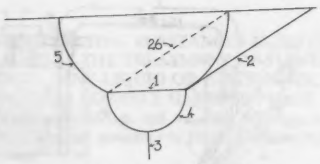
Darryl F. Mattox, 12 Rock Bath Rd., Palm Beach, N.S.W., 2108, Australia

Filed Aug. 20, 1979, Ser. No. 68,088

Claims priority, application Australia, Aug. 23, 1978, PD5620; Aug. 23, 1978, PD5621

Int. Cl.³ B63B *1/38*

U.S. Cl. 114—67 A **10 Claims**



1. A waterborne air cushion vehicle comprising, in combination, a flat rigid upper rectangular sheet-like platform, a plurality of flat rigid longitudinal walls attached substantially at right angles thereto and depending therefrom substantially parallel with the major axis of said platform, two of said walls being disposed as sidewalls along the respective edges of said platform, a plurality of longitudinally spaced laterally aligned arrays of flexible trough-shaped skirts respectively looped with a space therein and fastened via each longitudinal edge thereof with respect to the underside of said platform flush with but independently movable with respect to adjacent pairs of said walls but extendable to a lesser depth than that of said walls, a source of pressurized air admissable via apertures of fixed size at a relatively higher pressure to said skirts and also admissable at a relatively lower pressure via variable-sized openings remotely controlled and located respectively beneath said platform in communication with at least four square or rectangular opening-bottomed air cushion chambers disposed laterally in pairs and each bounded by an adjacent pair of said skirts and by an adjacent pair of said walls, and wherein the depth of said walls and of said skirts is so related to the flow rate of said air that the vehicle is buoyant upon water with said walls protruding into said water sufficiently to prevent air spillage via said walls when the vehicle is urged longitudinally through said water by propulsion means, and wherein said skirt air inlet openings are adapted to re-admit by reverse flow at least part of the compressed air in any one of said skirts independently in response to fugitive deflection of said skirts resulting from turbulence of said water, to thereby inhibit movement of said vehicle about the pitch axis thereof; characterized in that each said skirt is bag-like structure adapted to resist changes in its cross-sectional shape under load by virtue of captive air therein and is attached along one side thereof to the underside of said platform via a brace comprising a flexible sheet extending throughout the width of said skirt.

4,350,108

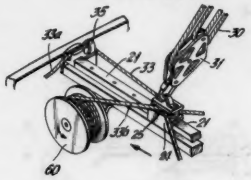
AUTOMATIC TRAVELLER TENDER

Seymour Vall, 35 W. 81 St., New York, N.Y. 10024

Continuation-in-part of Ser. No. 9,126, Feb. 5, 1979, Pat. No. 4,231,308. This application Nov. 3, 1980, Ser. No. 203,229

Int. Cl.³ B63H *9/10*

U.S. Cl. 114—102 **4 Claims**



1. An automatic sail tending system for a sailboat to maintain a constant heeling force of the sail acting on the boat during variations in wind force which system comprises a control line for controlling the angle of the sail with respect to the boat, a constant force spring reel, and means to correct adjustably the spring reel and the control line to establish a predetermined sail angle, the spring reel acting to balance the force in the control line to allow the sail to move to leeward upon an increase in wind force and to move to windward upon a decrease in wind force to adjust the sail angle to provide a constant sail heeling force.

4,350,109

WINDING ARRANGEMENTS

John C. Tattersall, Guildford, England, assignor to Olympic Power Winches Limited, England

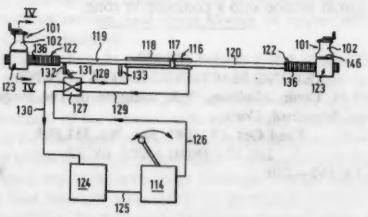
PCT No. PCT/GB79/00058, § 371 Date Dec. 14, 1979, § 102(e) Date Dec. 6, 1979, PCT Pub. No. WO79/00932, PCT Pub. Date Nov. 15, 1979

PCT Filed Apr. 10, 1979, Ser. No. 179,295

Claims priority, application United Kingdom, Apr. 14, 1978, 14744/78; Jul. 25, 1978, 30992/78; Oct. 12, 1978, 40286/78

Int. Cl.³ B63H *9/10*

U.S. Cl. 114—105 **8 Claims**



1. A winding arrangement for sheeting in a sail comprising:
(a) a winch drum;
(b) a piston-cylinder assembly having a double-acting piston, which is reciprocable within a cylinder;
(c) a manually operated pump means for supplying fluid under pressure to the piston-cylinder assembly;
(d) at least one rack member, having two toothed racks located on opposite outside edges thereof, coupled to the double-acting piston;
(e) means for directing the fluid under pressure supplied by the pump means alternately to opposite ends of the double-acting piston-cylinder assembly, thereby to reciprocate the piston, which effects reciprocating movement of the rack member;

(f) two unidirectional clutches, each having an input and an output shaft;

(g) a first gear means, meshing with one of the toothed racks of the rack member, coaxially mounted on the input shaft of each of the two unidirectional clutches;

(h) a second gear means mounted on the output shaft of each unidirectional clutch;

(i) a winch drum having a drive shaft mounted thereon; and

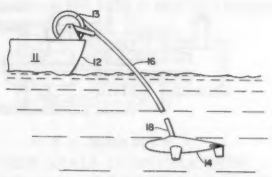
(j) a driving pinion gear coaxially mounted on the winch drum drive shaft and meshing with both second gear means of the two unidirectional clutches; whereby the reciprocating movement of the rack member causes the rotation, in opposite directions, of both first gear means, which, in turn, rotate the input shafts of the two unidirectional clutches, causing the rotation of the output shaft of whichever clutch is engaged and the second gear means mounted thereon, causing the driving pinion gear to rotate, driving the winch drum through the winch drum drive shaft.

4,350,110

INTEGRATED FAIRED TOWLINE WITH INTEGRAL LOCKING FEATURE

Richard K. Knutson, Gaithersburg; Bruce L. Webster, Bethesda; John W. Johnston, Gaithersburg, all of Md., and Peter P. Rispin, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 29, 1980, Ser. No. 221,157
Int. Cl.³ F16D *1/10*
U.S. Cl. 114—243 **8 Claims**



8. An elongate, low-drag fairing for towing submerged objects, comprises:

an elongate leading edge tension member extending between the submerged object and the towing vessel for withstanding the towing load of an underwater object, said leading member being formed of a composite material including a resin with high tensile strength fibers running parallel with the elongate dimension of said leading member, said leading member having a substantially U-shaped cross-section said leading member having a channel formed in the rear edge thereof;

an elongated trailing edge member of flexible material, said leading and trailing member integrally bonded together to form an integrated fairing having a streamlined hydrofoil cross-section shape with a resultant hydrodynamic center located aft of the interface defined between said leading and trailing members, and said leading member having a cross-sectional length which is between about 10 percent and about 20 percent of the chord length of the fairing said trailing member having a channel formed in the front edge thereof, said leading member channel and said trailing member channel being adjacently arranged so as to form a composite channel; and

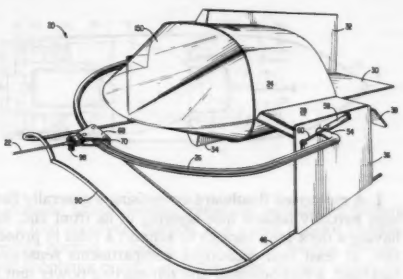
a flange member embedded in said composite channel and secured to said leading and trailing members for preventing relative displacements between said leading and trailing members and for improving the shape stability of the fairing.

4,350,111

LATERALLY AND VERTICALLY CONTROLLABLE UNDERWATER TOWED VEHICLE

William D. Boyce, II, 1 Blvd de la Gare, Valmondois, France (95760)

Filed May 30, 1980, Ser. No. 154,891
Int. Cl.³ B63G *8/14*
U.S. Cl. 114—245 **16 Claims**



1. A vehicle for movement underwater, said vehicle being connectable to an end of a tow cable extending away from a towing vessel and comprising:

a main body;

means for stabilizing said main body;

planing surfaces positioned on said main body for enhancing controlled lateral and vertical movement of said main body when said vehicle is being towed; and

means for interconnecting said main body with the end of a tow cable extending away from a towing vessel; and

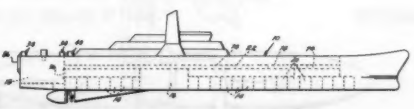
control means for effecting relative horizontal and vertical movement between the means for interconnecting and the planing surfaces to thereby vary forces exerted on said main body by the tow cable and effect horizontal and vertical movement of the vehicle with respect to the towing vessel, the relative movement between the means for interconnecting and the planing surfaces resulting in changing the point of attack of the towed vehicle on water flowing past the vehicle whereby said planing surfaces present an increased frontal area to the water thereby moving the vehicle with respect to the vessel towing the tow cable.

4,350,112

OCEAN TRANSPORTER VESSEL

Arthur E. Ayotte, 21340 NE. 14 Ave., Miami, Fla. 33179

Filed Jul. 1, 1966, Ser. No. 562,282
Int. Cl.³ B63B *35/035*
U.S. Cl. 114—260 **7 Claims**



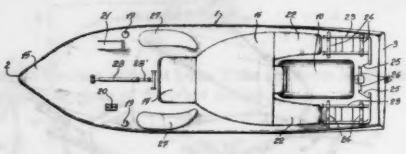
4. An improved design of multi-purpose ocean carrier comprising a hull, at least one horizontal deck, said hull having fixed structural means, and a liftable elevator platform for raising floating units from the level of the water to the level of the deck, said platform being guided within said fixed structural means and wherein said elevator platform operates in an elevator well which is enclosed within the confines of said hull and said well has common access to said deck and to the ambient water, and a sliding water-tight closure is provided for voluntarily sealing off said well from the ambient water.

4,350,113

MOTORIZED FLOATBOARD

Roland Moreau, 510 Monty St., Province of Quebec, Canada (H7A 2C3), and Robert Potvin, 6790 Renoir St., Auteuil, Canada (H7H 1A5)

Filed Jul. 31, 1980, Ser. No. 174,019
Int. Cl.[3] A63H *5/08*
U.S. Cl. 114—270 7 Claims



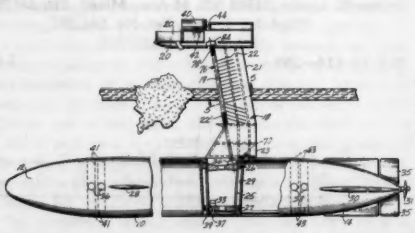
1. A motorized floatboard comprising a generally flat and at least partially hollow hull tapering at its front end, said hull having a deck long enough to support a rider in prone condition, at least two watertight compartments separated by a bulkhead, a fuel-operated and self-starting power unit located centrally and at the rear portion of said hull and having a propelling leg extending downwardly into the water, a rudder located aft of said power unit, a steering means located at the rear portion of said hull astride of said power unit to operate said rudder by the feet of a prone rider, an electrical power source for said power unit and located in said hull, a fuel reservoir also located in said hull, and spaced-apart handle grips and control means for said power unit mounted on said deck at the front portion of said hull and accessible to the hands of a prone rider, and wherein said power unit is protected by a cowl and said steering means consists of a pair of longitudinally-slidable ladder members, one on each side of said power unit, each said ladder member being linked to said rudder, whereby the floatboard may be steered by a prone rider by simple push or pull action on said ladder members by the feet of said rider.

4,350,114

SEMI-SUBMERSIBLE TANKER WITH DIRECTIONAL ICE CUTTERS

Joseph F. Schirtzinger, Pasadena, Calif., assignor to Sea-Log Corporation, Pasadena, Calif.

Filed Mar. 17, 1980, Ser. No. 131,185
Int. Cl.[3] B63G *8/04*
U.S. Cl. 114—339 5 Claims



1. A semi-submersible tanker for operation in ice covered waters, comprising:

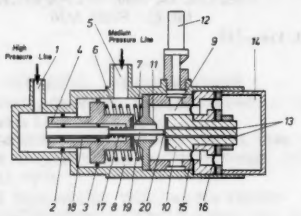
a submergible hull including propulsion means, depth control means, and attitude control means for directing the hull beneath the surface of the water and any ice, a bridge section, a bridge supporting mast projecting upwardly from the hull and supporting the bridge section above the surface of the water and any ice, bearing means in the hull supporting the bottom of the mast in the hull for rotation about a substantially vertical axis, rotary ice cutting means supported on and extending along one side of the mast and laterally offset from said axis between the hull and the bridge section for cutting ice encroaching on the mast from the direction of the cutting means, means rotating the supporting mast relative to the hull about said substantially vertical axis to position the ice cutting means between the mast and any encroaching ice, means for rotating the mast relative to the bridge section about an axis parallel to the axis of rotation of the mast relative to the hull, and means maintaining the angular position of the bridge section fixed relative to the hull with rotation of the mast.

4,350,115

WARNING SIGNAL DEVICE FOR RESPIRATORS

Adalbert Pasternack, Bad Schwartau, Fed. Rep. of Germany, assignor to Dragerwerk AG, Fed. Rep. of Germany

Filed Jan. 16, 1981, Ser. No. 225,657
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1980, 3004594
Int. Cl.[3] G01L *19/12*
U.S. Cl. 116—70 7 Claims

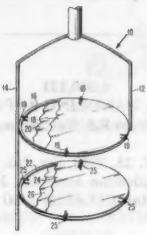


1. A warning signal device for a respirator, having a high pressure gas supply line for high pressure gas supply, and a medium pressure gas supply line, comprising: a housing defining a high pressure gas supply chamber to which the high pressure gas supply line is connected, a medium pressure chamber to which the medium pressure gas line is connected, a precontrol chamber and a control chamber; alarm means connected to said precontrol chamber, activatable by an alarm pressure in said precontrol chamber; a first valve member movable in said housing separating said high pressure gas supply chamber from said medium pressure chamber; a first valve seat between said medium pressure chamber and said precontrol chamber closed by said first valve member when gas pressure in said high pressure gas supply chamber is above a threshold value; a second valve member movable in said housing between said precontrol and said control chambers; a second valve seat between said medium pressure chamber and said precontrol chamber closable by said second valve member; means defining a throttle passage between said precontrol and said control chambers when said second valve seat is open and between said medium pressure chamber and said control chamber when said second valve seat is closed; and a sealing pressure piston movably mounted with and with respect to said first valve member having a surface exposed to said high pressure gas supply chamber, and abutting said second valve member when gas pressure in said high pressure gas supply chamber is above the threshold value to hold said second valve seat open and, when the gas pressure in said high pressure gas supply chamber falls to the threshold value, permitting said second valve member to move to close said second valve seat.

4,350,116
HOLDER FOR LIQUID PHASE EPITAXIAL GROWTH

Johannes Grandia; William G. McChesney; Hugo A. E. Santini, and Harold L. Turk, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 79,772, Sep. 28, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 219,075
Int. Cl.[3] B05C *13/02*
U.S. Cl. 118—500 4 Claims

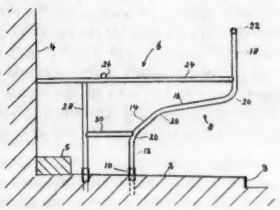


1. A wafer holder for use in growing liquid phase epitaxial films on wafers comprising:
a first leg extending vertically;
a second leg extending vertically and beyond said first leg;
a first ring for holding at least one wafer and connected to said first and second legs, and
a second ring for holding at least one wafer connected only to said second leg and spaced from said first ring wherein the mesa count on the films is held to a minimum.

4,350,117
FREE STALL CONSTRUCTION

Josef Hacker, Schulstrasse 7, 8254 Mittbach, Fed. Rep. of Germany

Filed Mar. 2, 1981, Ser. No. 239,416
Int. Cl.[3] A01K *1/00, 29/00*
U.S. Cl. 119—27 13 Claims

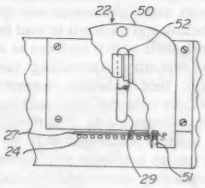


1. Cattle free stall construction for providing a resting feeding/place for cattle in which the cattle may move in and out freely and lay down therein without interfering with other cattle in adjacent stalls comprising a plurality of cantilever tube members separating the stalls from each other, said cantilever tube members being secured to the ground in the shoulder area of a reclining animal, said cantilever tube members extending upward and rearward to an end area of the stall where said members extend steeply upward beyond a standing animal, and a crossbeam (22) rigidly connecting the rear upper ends of said tube members (8) at a height such that cattle access to the stalls (2) is not hindered.

4,350,118
AUTOMATIC FEEDING APPARATUS

Earl W. Ostler, Billings, Mont., assignor to Agri-Systems, Billings, Mont.

Filed Mar. 13, 1981, Ser. No. 243,464
Int. Cl.[3] A01K *5/02*
U.S. Cl. 119—51 R 9 Claims

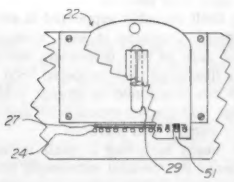


1. Automatic animal feeding apparatus including a feeding portion, a feed supplying portion, and a feed control portion; said feeding portion including a plurality of feeding stations, said feed supplying portion including feed storage means for supplying said feeding stations, mechanized transfer means capable of selectively conveying feed material from said feed storage means to each of said feeding stations, said feed control portion including a light source and a plurality of spaced sensing means at each of said feeding stations, said sensing means being capable of being activated by light supplied from said light source, means carried by an animal for diverting light from said light source with respect to said sensing means in a predetermined pattern, said sensing means being capable of transmitting signals to deciphering means located closely adjacent to said sensing means at each feeding station, at least two of said sensing means detecting proper orientation of said animal carried means with said sensing means, an odd number of said sensing means in addition to said orientation detecting sensing means detecting an identification pattern of a particular animal, said deciphering means of said feed control portion being connected electrically with deciphering means of all other feeding stations and with interrogating means, said interrogating means sequentially searching each of said deciphering means in a continuous rapidly repeating sequence, memory means capable of accepting an animal feeding schedule, means for comparing signals from said interrogating means with said animal feeding schedule, means for selectively activating said feed transfer means, recording means for compiling a log of quantities of feed material offered to particular animals and the time periods of such offerings.

4,350,119
ANIMAL FEEDING APPARATUS

Earl W. Ostler, Billings, Mont., assignor to Agri-Systems, Billings, Mont.

Filed Mar. 13, 1981, Ser. No. 243,469
Int. Cl.[3] A01K *5/02*
U.S. Cl. 119—51 R 12 Claims



1. An automatic animal feeding apparatus including a feeding portion, a feed supplying portion, and a feed control portion; said feeding portion including a feeding station, said feeding station including a trough member, said feed supplying

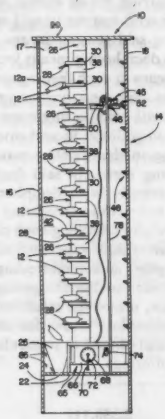
portion including feed storage means associated with said feeding station, transfer means associated with said feed storage means capable of selectively conveying feed material to said feed trough member, said feed control portion being operatively connected to said transfer means, said feed control portion including animal identifying means, said animal identifying means including a light source, a plurality of spaced phototransistors adjacent to said light source but normally shielded therefrom, said light source and said phototransistors being disposed below and adjacent to said feed trough member and arranged with their active surfaces in a generally vertical plane, electrical circuitry connecting said phototransistors with deciphering, feed schedule memory and comparing means, whereby light reflected from said light source onto one or more phototransistors by an identifying tag hanging from the neck of an animal positioned with its head in said feed trough member causes activated phototransistors to send signals to said deciphering means and depending upon the feed schedule in said memory means, said comparing means will activate said feed transfer means to convey predetermined quantities of feed material from said storage means to said trough member.

4,350,120

AUTOMATIC FEEDER FOR ANIMALS

L. Gordon Bittle, 141 Syracuse Walk, Long Beach, Calif. 90803

Filed Apr. 27, 1981, Ser. No. 257,733
Int. Cl.³ A01K *5/02*
U.S. Cl. 119—51.13 **8 Claims**



1. An automatic feeder for animals, the feeder adapted to dispense packaged food and comprising:

a housing having a chute and a discharge chamber positioned at the lower end of said chute;

a plurality of contiguously stacked bins adapted to receive said packaged food therein;

a dispensing shelf movably supported in each of said bins;

an ejector means mounted in said housing for sequential ejection of each of said dispensing shelves, in order to selectively discharge said packaged food at a given time;

a retainer means positioned to engage said ejector means, and to align said ejector means with said dispensing shelf in order to engage said shelf;

said ejector means including a guide means to guide said ejector means for vertical movement between said bins and said retainer means, and to align said ejector means horizontally with respect to said movable shelves; and

wherein said ejector means comprises:

a horizontally positioned platform interconnected to said guide means;

an ejector carriage mounted to said platform, one end thereof being positioned to engage said movable shelf and the opposite end thereof being positioned to engage said retainer means; and

actuating means connected to said ejector carriage to actuate said ejector carriage;

a timing means operably connected to said ejector means to activate said ejector means, at a selected time period; and

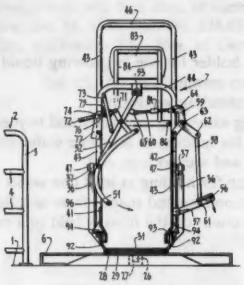
means disposed in said discharge chamber to open said packaged food as said package passes therethrough.

4,350,121

ANIMAL HANDLING APPARATUS

Norman P. Lemin, Purton Rd., Pakenham, Victoria, 3810, Australia

Filed Jul. 23, 1980, Ser. No. 171,467
Claims priority, application Australia, Jul. 25, 1979, PD9702
Int. Cl.³ A61D *3/00*
U.S. Cl. 119—103 **9 Claims**



1. Animal handling apparatus including a base, a floor for supporting an animal in a normal upright position, said floor being mounted on the base for rotation about a substantially vertical axis, an animal cage including sides and means for holding an animal, said animal cage being open at the bottom and being mounted to the floor to be pivotable as a whole about a substantially horizontal axis to turn an animal from a normal upright position to give access to the ventral portion of the animal; and said animal cage having two opposite ends, one of which is normally open to provide access for the animal and which is provided with a support for the buttocks of the animal which is movable from a position in which it does not obstruct said one end to a position in which it obstructs said one end and acts as a support for the buttocks of the animal when said animal cage is pivoted about said substantially horizontal axis to give access to the ventral portion of the animal.

4,350,122

INSECT TRAPPING COLLAR

Thomas K. Shotwell, Dallas, Tex., assignor to Farnam Companies, Inc., Phoenix, Ariz.

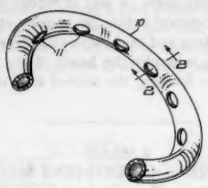
Filed Apr. 9, 1981, Ser. No. 252,378
Int. Cl.³ A01K *27/00*
U.S. Cl. 119—106 **5 Claims**

1. An insect trapping collar including in combination:

a base collar member in the form of a hollow tube having holes formed through the inner side thereof for placement about the neck of an animal, the holes in said collar member facing the neck of an animal when said collar member is in place; and

a tacky substance coated on at least a portion of the hollow

interior of said base collar member for entrapping insects inside said collar member so that trapped insects are not



exposed to view when said base collar member is in place on an animal.

4,350,123

HAND-HELD POWER TOOL WITH A COMBUSTION MOTOR

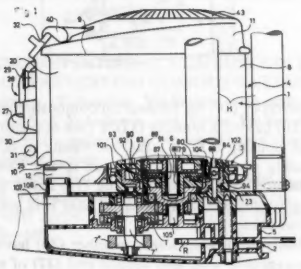
Günter Kossek, Gechingen, and Heinz Emmerich, Böblingen, both of Fed. Rep. of Germany, assignors to Solo Kleinmotoren GmbH, Sindelfingen, Fed. Rep. of Germany

Filed Feb. 2, 1981, Ser. No. 230,594

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1980, 3004948

Int. Cl.³ F02B *63/02*

U.S. Cl. 123—2 **30 Claims**



1. In a hand-held power tool, a combination comprising a drive unit including a first housing, and a combustion motor fixed to and arranged in said first housing and having an output shaft; a work unit including rotatable tool means, an input shaft, transmission means between said input shaft and said tool means for rotating the latter upon rotation of said input shaft, and a second housing; quick-acting connecting means for releasably connecting said first housing to said second housing, said quick-acting connecting means comprising a centralizing ring coaxial with said output shaft and fixed to a stationary part of said combustion motor, a coupling ring turnably mounted on said centralizing ring, an annular coupling member fixed to said second housing, said coupling ring and said coupling member having cooperating cam means having inclined faces, spring means connected to said coupling ring for turning the latter in a direction in which said inclined faces are tightly engaged to couple said coupling ring with said coupling member and therewith said first housing to said second housing, and a lever fixed to and radially projecting from said coupling ring and moveable from an arresting positioning holding said coupling ring in a stationary position to a releasing position permitting turning of said coupling ring under the action of said spring means; and coupling means coaxial with said connecting means for coupling said output shaft of said combustion motor with said input shaft of said work unit.

4,350,124

OVERFLOW DEVICE FOR VEHICULAR CARBURETOR

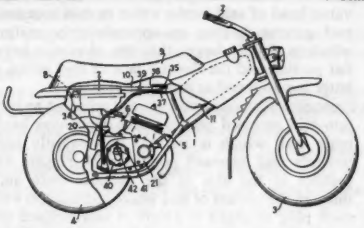
Akihiro Kitano, and Kunio Kamekawa, both of Hamamatsu, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sep. 5, 1980, Ser. No. 184,644

Claims priority, application Japan, Sep. 29, 1979, 54-125638

Int. Cl.³ F02M *19/06*

U.S. Cl. 123—198 R **6 Claims**



1. An overflow device for a vehicular carburetor which is carried on the body of a vehicle and includes a float chamber whose overfilling is prevented by drainage through said overflow device, said overflow device comprising: a reservoir disposed at an elevation beneath said float chamber, an overflow tube opening into said float chamber at an intended maximum fuel level therein and discharging into said reservoir, and a vent tube rising from an upper level in said reservoir to a vent opening at an elevation above said carburetor.

4,350,125

FUEL INJECTION TYPE INTERNAL COMBUSTION ENGINE

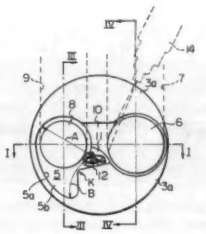
Mutsumi Kanda; Kiyoshi Nakanishi, both of Susono, and Tokuta Inoue, Mishima, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 29, 1980, Ser. No. 182,607

Claims priority, application Japan, Sep. 20, 1979, 54/129410[U]

Int. Cl.³ F02B *19/16, 3/00*

U.S. Cl. 123—261 **11 Claims**



1. In an internal combustion engine comprising:

a cylinder block having a cylinder bore therein;

a piston reciprocally movable in said cylinder bore and having a flat top face;

a cylinder head having a circular inner wall portion covering the cylinder bore and comprising a flat portion substantially parallel to the top face of the piston and a recessed portion which is arranged adjacent to the periphery of said inner wall and has a circumferential wall and a top wall, said flat portion being arranged at a position close to the flat top face of said piston when the latter is positioned at top dead center for forming a squish area therebetween, said piston and said circular inner wall

portion of said cylinder head forming a combustion chamber therebetween;

an intake valve arranged on said flat portion and having a valve head which has a front face exposed to said combustion chamber, the front face of said valve head being approximately coplanar with said flat portion;

an exhaust valve arranged on the top wall of said recessed portion and having a valve head;

a groove formed in said flat portion and extending from the valve head of said intake valve to said recessed portion, said groove having an approximately uniform depth which is slightly larger than the clearance between said flat portion and the flat top face of said piston when the latter is positioned at top dead center;

a depression formed in said groove adjacent to and opening into said recessed portion, said depression having a flat inner wall which is inclined downwardly and slightly towards said recessed portion with respect to a plane parallel to the axis of the cylinder bore and passing through the centers of said intake and exhaust valve heads;

a spark plug arranged in a bore in said inclined wall of the depression in said groove and having a spark gap located approximately on the axis of the cylinder bore, so that the flame propagation distances to the most remote surfaces of the circumferential walls of the recessed portion are minimized; and

an intake passage formed in said cylinder head and connected to said combustion chamber via said intake valve, said cylinder head having a portion which is located between said recessed portion and said intake passage, and which portion has a wall portion defining part of said intake passage;

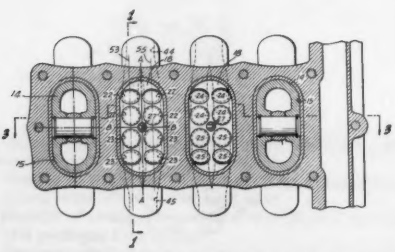
the improvement wherein a fuel injector is arranged in said intake passage and has a nozzle which is directed to said wall portion.

4,350,126

INTERNAL COMBUSTION ENGINE

Shoichi Honda, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1980, Ser. No. 180,957
Claims priority, application Japan, Sep. 4, 1979, 54-113315
Int. Cl.³ F02F *1/42, 3/28*
U.S. Cl. 123—315 **7 Claims**



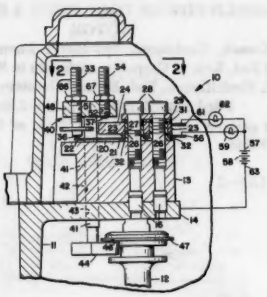
1. In an internal combustion engine having a piston mounted to slide in a cylinder bore and connected to a crank shaft by a connecting rod, the improvement comprising, in combination: the piston and the cylinder bore being oblong in cross section having major dimensions at right angles to an axis of the crank shaft, walls cooperating with said piston and said cylinder bore to form an oblong combustion chamber having major and minor dimensions with an arched roof along the major dimension thereof, a set of poppet-type intake valves communicating with said combustion chamber and all on one side of a transverse plane through the minor dimension of said combustion chamber, a set of poppet-type exhaust valves communicating with said combustion chamber and all on the other side of said transverse plane, a spark plug communicating with said combustion chamber and positioned substantially on sid transverse plane, each of the intake and exhaust valves having a longitudinal axis inclined with respect to the cylinder bore axis, the axes of two intake valves and two exhaust valves lying in one plane along the major dimension of said combustion chamber and intersecting at a common point, the angular spacing between said two intake valves and said two exhaust valves being substantially the same, whereby the heads of the latter said four valves cooperate in forming the arched roof of said combustion chamber.

4,350,127

TORQUE SPRING ADJUSTMENT MECHANISM

Dennis M. King, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 25, 1981, Ser. No. 247,566
Int. Cl.³ F02D *31/00*
U.S. Cl. 123—364 **10 Claims**



1. In a governor (**10**) for an internal combustion engine, said governor (**10**) having a housing (**11**), a rack actuator (**12**) movable in said housing (**11**) in a fuel-increasing direction and a fuel-decreasing direction, and a torque spring (**20**) with one end (**21**) thereof fixed to said housing (**11**) and a second end (**22**) resiliently deflectable relative to said first end (**11**), the improvement comprising:

a first axially-adjustable screw member (**33**) having an end (**36**) engageable with said second end (**22**) of said torque spring (**20**),

a stop member (**24**),

a second axially-adjustable screw member (**34**) having an end (**37**) engageable with said stop member (**24**),

means (**40**) for moving said first screw member (**33**) axially and in progressively-increasing, spring deflecting engagement of said first screw member end (**36**) with said second end (**22**) of said torque spring (**20**) in response to movement of said rack actuator (**12**) in its fuel-increasing direction, for concurrently moving said second screw member (**34**) axially and toward said stop member (**24**), and for preventing further movement of said rack actuator (**12**) in said fuel-increasing direction upon engagement of said end (**37**) of said second screw member (**34**) and said stop member (**24**).

4,350,128

FUEL FLOW CONTROL SUPERCHARGED ENGINE

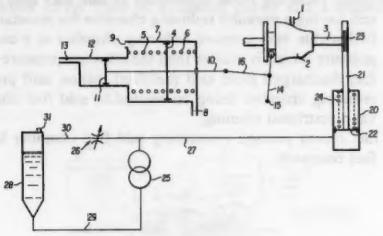
Jean-Pierre Boudy, Mennecy, France, assignor to Renault Sport, Viry-Chatillon, France

Filed Nov. 4, 1980, Ser. No. 203,884
Claims priority, application France, Nov. 15, 1979, 79 28257
Int. Cl.³ F02D *1/06, 1/14*
U.S. Cl. 123—369 **8 Claims**

1. A fuel flow regulation device for a supercharged engine of the type having an injection pump whose piston's bottom position is determined by a moving stop, comprising:

a tridimensional cam contacting said stop, the movement of said cam in at least one of two movement components actuating the movement of said stop;

first means for actuating one of said movement components, said first means including a first piston balanced between two springs and subjected on one side to engine intake pressure and on the other side to atmospheric pressure, a second piston connected to said first piston and having a



diameter smaller than that of said first piston by a predetermined ratio, said second piston being subjected to engine exhaust pressure on a side opposite said side of said first piston which is subjected to engine intake pressure, and a piston output connected between said pistons and said cam; and

second means for actuating the other of said movement components, said second means including a tachometric device sensitive to the speed of rotation of said engine.

4,350,129

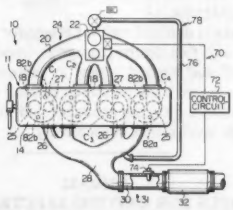
SPARK-IGNITION INTERNAL COMBUSTION ENGINE CAPABLE OF PREVENTING NOXIOUS GAS EMISSIONS

Yasuo Nakajima, Yokosuka; Yoshimasa Hayashi; Shin-ichi Nagumo, both of Yokohama, and Tooru Yoshimura, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation-in-part of Ser. No. 728,599, Oct. 1, 1976, abandoned. This application Apr. 5, 1978, Ser. No. 893,693

Int. Cl.[3] **F02D** *13/04;* **F02B** *32/00;* **F02M** *7/00;* **F01L** *1/34*

U.S. Cl. 123—440 **19 Claims**



1. A spark-ignition internal combustion engine, comprising

means for defining a combustion chamber having an intake and exhaust valve;

air-fuel mixture supply means for producing an air-fuel mixture by mixing fuel and intake air and supplying it into the combustion engine;

means for adding substantially inert gas to the air-fuel mixture in the combustion chamber, said substantially inert gas consisting of mixed gases which remain substantially inert in the combustion carried out in the combustion chamber, said inert gas adding means including exhaust gas recirculating means for recirculating a portion of the exhaust gas of the engine back to the combustion chamber through the air-fuel mixture supply means of the engine, and means for variably controlling the amount of residual gases remaining in the combustion chamber after each exhaust stroke of the engine in response to an engine operating parameter, said variable control means including valve overlap control means for varying the valve overlap of said intake and exhaust valves by an amount greater than about 35 degrees in crank angle of the engine in response to changes in the engine operating parameter, whereby said substantially inert gas includes the recirculated exhaust gas and residual gas which remains in the combustion chamber;

two spark plugs disposed in the combustion chamber for igniting the air-fuel mixture mixed with the substantially inert gas;

a three-way catalytic converter capable of reducing nitrogen oxides and oxidizing carbon monoxide and hydrocarbons, communicable with the combustion chamber for receiving the exhaust gases discharge from the combustion chamber, said three-way catalytic converter being most effective when supplied with the exhaust gases which are produced by supplying the combustion chamber with the air-fuel mixture having a stoichiometric air-fuel ratio; and

air-fuel ratio control means for controlling the air-fuel ratio of the air-fuel mixture supplied into the combustion chamber at the stoichiometric air-fuel ratio in accordance with the composition of the exhaust gases discharged from the combustion chamber.

4,350,130

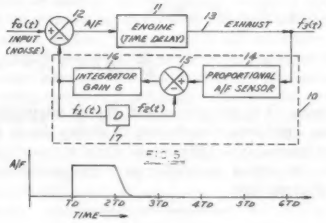
AIR FUEL MIXTURE CONTROL SYSTEM AND METHOD

Michael A. Shulman, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 27, 1980, Ser. No. 181,916

Int. Cl.[3] **F02B** *3/08;* **F02M** *7/12*

U.S. Cl. 123—440 **4 Claims**



1. An air fuel mixture control system for an internal combustion engine coupled to a mixing means for combining air and fuel into an air fuel mixture for the internal combustion engine, and an exhaust means for passing exhaust gases from the internal combustion engine, said air fuel mixture control system including:

an air fuel sensor means coupled to the exhaust gas means for providing a signal proportional to the average air fuel ratio;

an integrator means having an input coupled to said air fuel sensor means for receiving said average air fuel ratio signal, and an output coupled to the mixing means for providing a control signal;

a feedback means coupled from said output to said input of said integrator means for governing the output of said control system so as to improve response time to a change in the desired air fuel ratio while reducing the overshoot;

said feedback means having a transfer function defined by $f_2(t)=f_1(t)-f_1(t-T_D)$ wherein $f_2(t)$ is the output of said feedback means at time (t), $f_1(t)$ is the input to said feedback means at time (t), T_D is the time delay between changes initiated in the engine and detected in the exhaust; and

said control system being characterized by the equation

$$\frac{1}{G}\frac{d}{dt}f_3(t+T_D)+f_3(t+T_D)=\frac{1}{G}\frac{d}{dt}f_o(t)+f_o(t)-f_o(t-T_D)$$

wherein G is the gain of the integrator; $f_o(t)$ is the noise input to the mixing means at time (t); $f_3(t)$ is the output at the exhaust means at time (t).

4. A method for controlling the air fuel mixture for an internal combustion engine including the steps of:

mixing air and fuel into an air fuel mixture for the internal combustion engine;

passing exhaust gases from the internal combustion engine;

sensing the exhaust gases of the internal combustion engine with a titanium dioxide sensor;

generating an output signal proportional to the average air fuel ratio supplied to the internal combustion engine;

integrating the proportional signal to produce a control signal of governing an air fuel mixture;

feeding back a portion of the integrated control signal to modulate the signal to be integrated thereby improving the response of the control signal to a change in the desired air fuel ratio while reducing undesired overshoot in accordance with a transfer function defined by $f_2(t)=f_1(t)-f_1(t-T_D)$ wherein $f_2(t)$ is the signal being fed back at time (t) to modulate the signal being integrated, $f_1(t)$ is the portion of the integrated control signal being fed back at time (t), and T_D is the time delay between changes initiated in the engine and detected in the exhaust; and

said method for controlling the air fuel mixture being in accordance with the equation:

$$\frac{1}{G}\frac{d}{dt}f_3(t+T_D)+f_3(t+T_D)=\frac{1}{G}\frac{d}{dt}f_o(t)+f_o(t)-f_o(t-T_D),$$

wherein G is the gain of the step of integrating, $f_o(t)$ is noise input present at the step of mixing the air and fuel at time (t); and $f_3(t)$ is the output signal at time (t) associated with the step of generating an output proportional to the air fuel mixture.

4,350,131

FUEL INJECTION DEVICE OF AN INTERNAL COMBUSTION ENGINE

Hideo Kiuchi, Aichi, and Nobuyuki Kobayashi, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 30, 1980, Ser. No. 164,882

Claims priority, application Japan, Jul. 16, 1979, 54-90698

Int. Cl.³ F02D *3/02, 5/00*

U.S. Cl. 123—453 **6 Claims**

1. A fuel injection device of an internal combustion engine having an intake passage and an exhaust passage, said device comprising:

a fuel reservoir;

fuel feed means connected to said fuel reservoir and discharging fuel of a constant pressure;

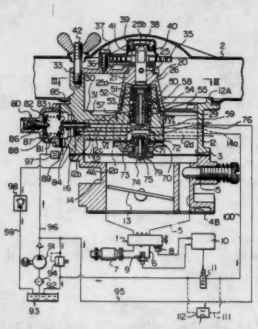
an injector unit having a fuel chamber, a back pressure chamber, a diaphragm separating said fuel chamber from said back pressure chamber, and a plunger operatively connected to said diaphragm, said fuel chamber having a fuel nozzle which opens into said intake passage and cooperates with said plunger for forming a mixture in said intake passage, said injector unit further comprising spring means for biasing said plunger towards said fuel nozzle for closing said fuel nozzle by said plunger when the engine is stopped;

a fuel feed passage connecting said fuel feed means to said fuel chamber;

flow control means arranged in said fuel feed passage for controlling the flow of a fuel to feed the fuel into said fuel chamber in an amount which is proportional to the amount of sucked air flowing within said intake passage;

pressure reducing mean connected to said fuel feed means and having a pressure reducing chamber for maintaining a fuel within said pressure reducing chamber at a constant pressure which is smaller than the constant pressure of the fuel discharged from said fuel feed means, said pressure reducing chamber being connected to said fuel chamber via a restricted opening;

a fuel return passage connecting said fuel chamber to said fuel reservoir;



an oxygen concentration detector in said exhaust passage for alternately producing a low level signal and a high level signal, said low level signal representing an air-fuel ratio of said mixture that is larger than the stoichiometric air-fuel ratio, said high level signal representing an air-fuel ratio of said mixture that is less than the stoichiometric air-fuel ratio;

control means for producing continuous output pulses having a constant period, but variable pulse widths which vary in response to said low level signal and said high level signal; and,

valve means in said fuel return passage for controlling a flow area of said fuel return passage in response to the output pulses of said control means to reduce and increase the pressure in said back pressure chamber when said oxygen concentration detector produces said low level signal and said high level signal, respectively.

4,350,132

APPARATUS FOR DRIVING ELECTROMAGNETIC DEVICES, PARTICULARLY ELECTROMAGNETIC INJECTION VALVES IN INTERNAL COMBUSTION ENGINES

Klaus Harsch, Ditzengen, and Peter Schülzke, Hemmingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 65,700, Aug. 10, 1979, abandoned. This application Apr. 23, 1981, Ser. No. 256,753

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1978, 2835228

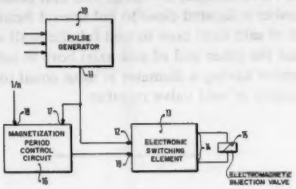
Int. Cl.³ F02B *3/00;* **H01H** *47/32*

U.S. Cl. 123—490 **8 Claims**

1. In an apparatus for driving an electromagnetic device, such as the electromagnetic fuel injection valves of an internal combustion engine, having an injection pulse generator for generating a train of actuating pulses, as a function of engine

operating parameters, for actuating the electromagnetic device, the improvement comprising:

a magnetization period control circuit arrangement connected to the injection pulse generator; and switch means connected to the magnetization period control circuit arrangement and the electromagnetic device, wherein the magnetization period control circuit arrangement and the switch means provide for closure of the electromagnetic device for a portion of the period between successive pulses in the train of actuating pulses and a controlled



advanced magnetization of the electromagnetic device for a different portion of the period between successive pulses in the train of actuating pulses, said magnetization period control circuit arrangement comprising:

at least one timing element means connected to the switch means and to the injection pulse generator for actuation by the train of actuating pulses; and

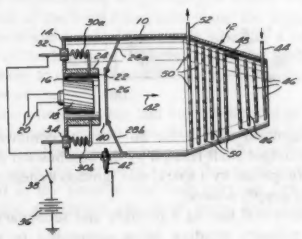
control means connected to said at least one timing element means for controlling the actuation time of said at least one timing element means and consequently the onset of the advanced magnetization.

4,350,133

COLD START CHARACTERISTICS OF ETHANOL AS AN AUTOMOBILE FUEL

Leonard Greiner, 2750-C Segerstrom, Santa Ana, Calif. 92704

Filed May 19, 1980, Ser. No. 151,191
Int. Cl.³ F02M *13/00*
U.S. Cl. 123—550 **23 Claims**



1. An alcohol fuel burner and decomposer comprising:

means for preheating at least one stream of fuel;

means for mixing said preheated fuel with air;

means for igniting the resulting air-fuel mixture;

combustion chamber means for containing the ignited air-fuel mixture during combustion thereof;

heat exchange confining means constructed and disposed to receive combustion products from the combustion chamber means in an entrance of a relatively larger size, directing the combustion products through a progressively smaller flow area to an exit of relatively smaller size, as compared with the entrance, and

heat exchange conduit means in the heat exchange confining means for conducting a stream of fuel in heat exchange contact with the combustion products for heating said fuel in said conduit means to the decomposition temperature of the fuel for forming a hydrogen gas containing starter fuel stream,

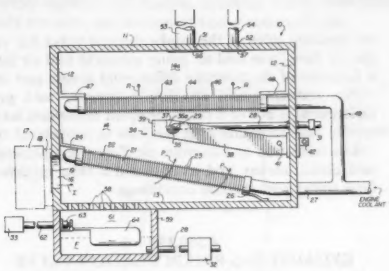
the heat exchange confining means and heat exchange conduit means being so constructed and configured that the mass flow rate of combustion products increases from entrance to exit and the heat exchange rate between the combustion products and the fuel in the heat exchange conduit means remains generally constant from entrance to exit.

4,350,134

METHOD AND APPARATUS FOR PRODUCING AN AIR/FUEL VAPOR MIXTURE

William D. Sparks, 2657 Gary Way, Sacramento, Calif. 95815

Filed Apr. 7, 1980, Ser. No. 137,760
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **10 Claims**



1. Apparatus for producing an air/fuel vapor mixture for an internal combustion engine or the like comprising, in combination, an enclosure having a side wall, a top wall and a bottom wall defining an interior, air inlet means on one of said enclosure walls for introducing ambient air into said enclosure interior, air heating means disposed within said enclosure interior for heating said ambient air, means for injecting liquid fuel into said enclosure interior, fuel vaporization means distinct from said air heating means disposed in said enclosure interior above said air heating means for vaporizing said injected fuel to provide a mxiture of vaporized fuel and additional heated ambient air, heating means disposed in said enclosure interior above said fuel vaporization means for heating said air/fuel vapor mixture and outlet means in one of said enclosure walls for conducting said heated air/fuel vapor mixture from said enclosure interior to a remotely located combustion zone for engine combustion.

4,350,135

SUPERCHARGING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Gary L. Casey, Troy; Bruce J. Harvey, Sterling Heights; Kenneth A. Hebert, Garden City, and William C. Eddy, West Bloomfield, all of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Oct. 29, 1979, Ser. No. 88,970
Int. Cl.³ F02B *33/36*
U.S. Cl. 123—564 **18 Claims**

1. A supercharging system for an internal combustion engine having an air intake with an intake throttle valve disposed therein controlling the flow of air into said air intake, said system comprising:

air pump means for receiving air through an inlet and producing a flow of compressed air into said air intake;

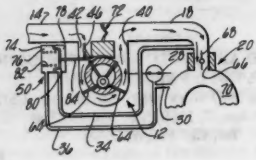
means mechanically driving said air pump means by said internal combustion engine, said means including clutch means operable to selectively establish drive to said air pump means;

clutch control means including means causing said clutch

means to be activated in a predetermined operating range of said internal combustion engine and causing said clutch means to be deactivated with said internal combustion engine operating outside of said predetermined range;

means establishing natural aspiration into said air intake whenever said compressed air flow from said air pump means into said air intake is below a predetermined level;

modulator means responsive to the pressure in the air intake



on opposite sides of the intake throttle valve for varying the air flow from said air pump means to said air intake as a function of the pressure differential across said throttle valve, reducing said air flow whenever said pressure differential is above a predetermined maximum level;

whereby said supercharging air flow is modulated to provide a transition to maximum air flow upon activation of said clutch means, and to enable less than maximum air flow under part throttle conditions.

4,350,136

EXHAUST GAS RECIRCULATION VALVE

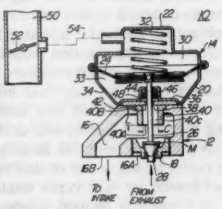
Syozo Yanagisawa, Tokaimura, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 5, 1981, Ser. No. 240,856

Claims priority, application Japan, Mar. 7, 1980, 55-29677

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—568 **11 Claims**



1. An exhaust gas recirculation valve comprising:

(a) a passage structure defining therein an exhaust gas recirculation passage having an exhaust gas inlet and an exhaust gas outlet, said passage structure including an orifice provided in said exhaust gas recirculation passage, and a guide opening communicating said exhaust gas recirculation passage and the outside of said passage structure with each other;

(b) a valve member having its outer periphery diverging in a direction in which exhaust gas flows, said valve member cooperating with said orifice and being movable relative to said orifice between a first position in which exhaust gas flow passing through said orifice is maximized and a second position in which the exhaust gas flow passing through said orifice is minimized;

(c) a valve stem having one end thereof connected to said valve member and extending through said guide opening, said valve stem having the other end thereof disposed outside of said passage structure, said valve stem having a diameter slightly smaller than the diameter of said guide opening;

(d) actuator means associated with the other end of said valve stem for actuating said valve stem to move said valve member between said first and second positions;

(e) a tubular wall member projecting into said exhaust gas recirculation passage, said tubular wall member defining therein an axial bore having one end thereof facing to and communicating with said guide opening and the other end facing to said valve member, said valve stem extending through said axial bore;

(f) said tubular wall member projecting into said exhaust gas recirculation passage a distance which is such that when said valve member moves to said first position, said valve member is located close to but spaced from said the other end of said axial bore in said tubular wall member; and

(g) said the other end of said axial bore in said tubular wall member having a diameter at most equal to the maximum diameter of said valve member.

4,350,137

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

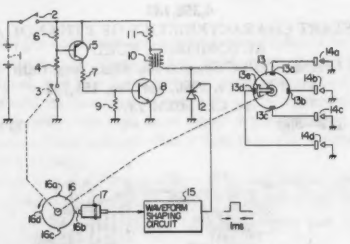
Toru Yoshinaga, Okazaki; Toshihiko Igashira, Toyokawa; Kouichi Mori, Okazaki; Hisasi Kawai, Toyohashi, and Seiji Morino, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 24, 1981, Ser. No. 257,139

Claims priority, application Japan, May 29, 1980, 55-72273; May 29, 1980, 55-72274

Int. Cl.³ F02P *7/00*

U.S. Cl. 123—617 **4 Claims**



1. An ignition system for an internal combustion engine having an output shaft rotated by the combustion of combustible mixture ignited by a spark, said ignition system comprising:

a power supply source;

an ignition coil having a primary and secondary windings, said primary winding being connected to said power supply source and said secondary winding generating a spark voltage when said primary winding is deenergized;

a spark plug connected to said secondary winding to be supplied with said spark voltage to thereby ignite the combustible mixture of said internal combustion engine;

first switching means connected in series with said primary winding for energizing and deenergizing said primary winding by said power supply source in response to the conduction and nonconduction thereof, respectively;

second switching means connected to said secondary winding in parallel relation with said spark plug for preventing said spark voltage from being supplied to said spark plug in response to the conduction thereof; and

control means connected to said second switching means for switching said second switching means from the nonconduction to the conduction at a selected instant in time after the generating of said spark voltage.

4,350,138
AXIALLY-SPLIT ARCHERY BOW LIMB

Joseph M. Caldwell, 2259 W. Big Tujunga Canyon, Tujunga, Calif. 91042

Filed Aug. 1, 1980, Ser. No. 174,544
Int. Cl.³ F41B 5/00
U.S. Cl. 124—24 R 19 Claims

1. An elongate resilient limb for a compound archery bow, the limb defining an outboard limb end and an inboard limb end at opposite ends of an elongate limb axis;

the limb including mounting means disposed along the length of the limb in spaced relation to the limb outboard end adapting the limb to be secured to a handle riser of the archery bow;

the outboard limb end being forked to define an outboard opening crotch between a pair of limb tips, the crotch coming to a taper across the elongate axis at a location intermediate the outboard and inboard limb ends, the limb tips defining a passage for receiving an axle for mounting a pulley perpendicular to the elongate axis of the limb;

the material of the limb being split along the elongate axis from the inboard end of the crotch taper for a substantial portion of the length of the limb toward the limb inboard end thereby to divide the limb into two portions on opposite sides of the axis; and

means cooperating between said limb portions at at least one selected location toward the limb inboard end from the crotch for holding said limb portions sufficiently together so that, upon application of a limb flexing force to an axle received in the passage, the limb portions flex together essentially as though the limb were unsplit along its length.

4,350,139
SOLID FUEL HEATER WITH IMPROVED PRIMARY/SECONDARY AIR CONTROL SYSTEM

John F. Robichaud, 35 Mountain Ave., White River Junction, Vt. 05001

Filed Jan. 11, 1980, Ser. No. 111,500
Int. Cl.³ F24C 1/14
U.S. Cl. 126—77 8 Claims

1. A solid fuel heater comprising:

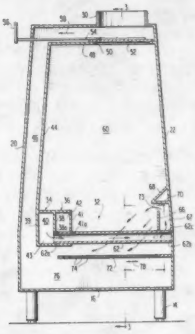
a generally hollow vertical metal enclosure having top, bottom and generally vertical front, rear and opposed sidewalls defining a vertical primary combustion chamber,

a stack extending vertically upwardly from the top of said enclosure and opening to said combustion chamber,

a generally vertical partition means extending partially along one generally vertical wall and spaced therefrom to define a generally vertical hot air flow passage to one side of said combustion chamber,

a plurality of interposed coplanar, first and second spaced horizontal air draft tubes extending respectively across the bottom of the primary combustion chamber from said generally vertical partition means to the generally vertical wall opposite that one wall forming with said partition means, the hot air flow passage, said air draft tubes forming a primary grate,

primary and secondary air manifold headers open to the enclosure exterior and operatively coupled, respectively, to the ends of said first and second horizontal air draft tubes near said generally vertical partition means, said first tubes at their ends opposite the primary manifold headers and adjacent the opposite generally vertical wall bearing openings which open upwardly towards the top of said metal enclosure, and said second horizontal tubes at their ends opposite said secondary manifold header and adjacent the opposite generally vertical wall bearing openings which open downwardly towards the bottom of said metal enclosure,



access means within said metal enclosure for supplying solid fuel to said primary combustion chamber and onto said primary grate;

whereby, primary air enters said primary manifold header and flows through said first horizontal air draft tubes to preheat said primary air and escapes through the openings within said first tubes and enters said primary combustion chamber at the lower portion thereof to effect primary combustion of the lower ends of the solid fuel and then passes across the length of said air draft tubes and downwardly between said first and second groups of horizontal tubes to seek the hot air passage to the stack, while secondary air enters said secondary air manifold header and flows horizontally through said second air draft tubes where it is preheated prior to discharge through the openings within the bottoms of said second tubes for mixing with the primary air along the full length of said air draft tubes for effecting combustion of gases given off by primary combustion of the solid fuel and combustion of solid fuel particles falling beneath said primary grate.

4,350,140
COOKING APPARATUS

Bert Hamilton, Jr., Oklahoma City, Okla., assignor to Jet-It-Done, Inc., Oklahoma City, Okla.

Filed Apr. 8, 1980, Ser. No. 137,627
Int. Cl.³ F24C 1/16
U.S. Cl. 126—276 31 Claims

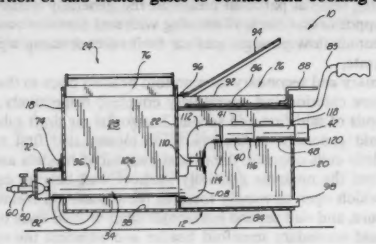
1. A cooking apparatus comprising:

container means for holding a cooking liquid;

a cooking surface disposed adjacent said container means;

heat exchanger means for transferring heat to both said cooking liquid in said container means to cook an edible

article and said cooking surface to cook a second edible article, said heat exchanger means including at least one tube means extending through said container means for conveying heated gases therethrough and beneath said cooking surface for conveying heated gases thereto, a portion of said heated gases to contact said cooking surface through an opening in said tube means disposed beneath said cooking surface; and



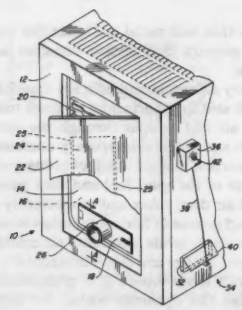
burner means, having a burner outlet directed into an inlet of said tube for directing a jet of flame into said inlet of said tube means and heating gases conveyed through said tube means, through said container means and beneath said cooking surface through said opening.

4,350,141

BLOW BACK PREVENTION APPARATUS FOR A WOOD-BURNING STOVE

Joseph N. Miller, Overland, Mo., assignor to Jackes-Evans Manufacturing Company, St. Louis, Mo.

Filed Apr. 30, 1979, Ser. No. 34,571
Int. Cl.³ F23L *3/00*; F23M *7/00*
U.S. Cl. 126—287 **6 Claims**



1. In a heating unit having a combustion chamber enclosed within an outer housing, apparatus for preventing blow back, comprising:

a first door for providing access to the combustion chamber, said first door being movable between a closed and an open position;

a second door for providing access through the outer housing to said first door, said second door being movable between a closed and an open position;

a first air inlet for supplying air to the combustion chamber;

a thermostatic damper for controlling the rate of combustion in the combustion chamber by restricting the quantity of air supplied to the combustion chamber via said first air inlet;

a second air inlet for providing an air passage to the combustion chamber; and

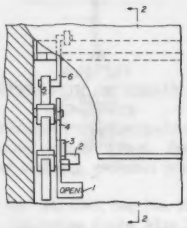
closure means rigidly mounted on said second door, said closure means being dimensioned to block said second air inlet when said second door is closed, said closure means being positioned to restrict the flow of air through said second air inlet when said second door is in the closed position and to allow air to flow into the combustion chamber through said second air inlet when said second door is not in the closed position, whereby a substantial quantity of air is permitted to flow into the combustion chamber when said second door is opened before said first door to the combustion chamber is opened.

4,350,142

FIREPLACE DAMPER INDICATOR

Charles L. Beyer, 745 Woodlake Dr., Sacramento, Calif. 95815, and Billy E. Fox, 5620 Dewey Dr., Fair Oaks, Calif. 95628

Filed Jan. 5, 1981, Ser. No. 222,633
Int. Cl.³ F23L *3/00*; G09F *19/02*
U.S. Cl. 126—288 **2 Claims**



1. A fireplace damper door indicator assembly for revealing an open or closed position of a damper door comprising: a link pivotally connected to the door at one extremity of said link, a damper arm having one extremity pivotally connected to said link at said link's other extremity; and means connected to said damper arm provided with indicators whereby said indicators tell whether said damper door is open or closed wherein said means comprises a first indicator arm having a substantially inverted "L" shaped configuration pivotally connected to said damper arm at the point of intersection of two legs that form the "L" and an outstanding tab at a lowermost extremity of said first indicator arm indicating "open", and a second indicator arm pivotally connected to said first indicator arm forward thereof but which is prevented from overlying said first indicator arm by a stop member on said damper arm interposed between said first and second indicator arms and another outstanding tab on said second indicator arm indicating "closed" so that rotation of said damper arm selectively exposes one of said tabs.

4,350,143

SOLAR POWER STATION HAVING GROUPS OF SOLAR COLLECTORS

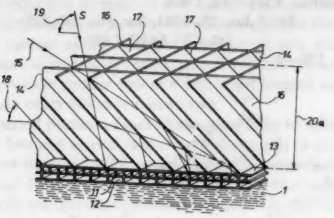
Nikolaus Laing; Ingeborg Laing, and Oliver Laing, all of 7148 Remseck, 2, Hofener Weg 35-37, Aldingen, Fed. Rep. of Germany

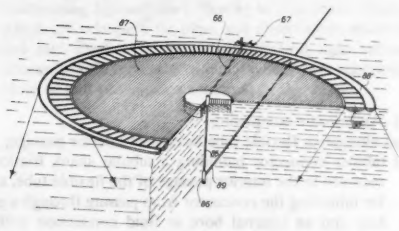
Continuation-in-part of Ser. No. 59,606, Jul. 23, 1979, abandoned, which is a division of Ser. No. 620,250, Oct. 6, 1975, Pat. No. 4,172,766. This application Aug. 4, 1981, Ser. No. 290,006

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1975, 2543687; Italy, Oct. 7, 1975, 28024 A/75; France, Oct. 8, 1975, 75 31612; Japan, Oct. 9, 1975, 50-121388; United Kingdom, Oct. 9, 1975, 41446/75
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—415 **21 Claims**

1. A solar power station comprising a first group of solar collectors each of the collectors of which has a solar radiation absorbing layer, a plurality of spaced parallel walls upstanding

from said solar radiation layer forming an insulation structure preventing heat loss from said absorbing layer to ambient air and a plurality of first ducts in thermal contact with said solar absorbing layer through which a heat carrier fluid is adapted to flow and to be heated by heat from the heat absorbing layer; a second group of solar collectors each collector of which has a plurality of second ducts, solar concentration means for concentrating solar radiation onto said second ducts to further





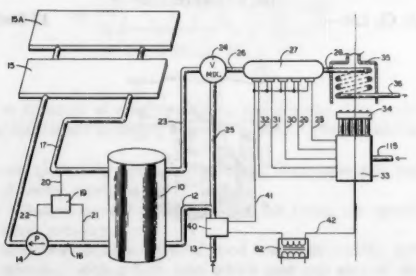
heat the heat carrier fluid therein; fluid cushion means beneath the collector of the first and second groups to support the same on a body of water; said first and second groups of collectors being joined to form an annular platform rotatable on a body of water; means for rotating said annular platform at a circumferential speed whereby said spaced parallel walls remain parallel to the projection of sun rays in a horizontal plane; and two underwater thermal storage areas each in thermal communication with one group of collectors.

4,350,144

HOT WATER HEATING SYSTEM

John R. Beckwith, Cupertino, Calif., assignor to Stanford Associates, Inc., Menlo Park, Calif.

Filed Aug. 18, 1980, Ser. No. 179,066
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—427 **3 Claims**



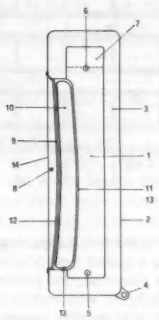
2. In a solar heating system of the type wherein water is preheated by use of solar heat and stored in a tank for subsequent removal from the tank through a conduit, an improvement for bringing the water to a predetermined temperature comprising a first control unit for restricting flow of water in said conduit to water having a temperature equal to or less than the desired temperature, and a second control unit having sensing means in said conduit downstream from said first control unit, heating means associated with said conduit and arranged when energized to heat water in said conduit, the sensing means of said second control unit being arranged to energize said heating means when the temperature of the water in said conduit is below the desired temperature.

4,350,145

SOLAR COLLECTOR FOR HEATING PURPOSES

Giuliano Bianchini, Narni, Italy, assignor to Societa Italiana Brevetti, Rome, Italy

Filed Jan. 30, 1981, Ser. No. 229,987
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—434 **10 Claims**



1. A solar collector for heating a fluid by transforming solar radiation energy into thermal energy, comprising in combination:

a body made of thermal insulating material having a reduced thickness with respect to the height and width thereof;

a coating of impervious material tightly fitting on said body and which has front, rear, upper and lower surfaces, said coating being provided with grooves on said surfaces, said grooves having a substantially vertical direction at said front and rear surfaces;

a plate of material which allows solar energy to be transferred from the one surface to the other surface thereof, said plate being juxtaposed on said front surface of said coating, substantially in contact with the peaks of said grooves, so that between said plate and said coating substantially vertical passages are defined;

a supporting frame including walls juxtaposed on said upper, rear and lower surfaces of said coating, substantially in contact with the peaks of said grooves, so as to define passages between said walls and said surfaces, said supporting frame being formed in coincidence with said rear surface, of a good heat conducting material, said supporting

frame being also fluid tight sealed with the side faces of said body and with the perimeter of said plate, said supporting frame being part of a housing which defines a closed chamber;

a liquid having a low thermal capacity and a high thermal expansion coefficient, which fills said passages between the plate, the supporting frame and said coating;

a check valve element, which in the one position allows flow of said liquid through said passages in an upward direction along said front surface and in a downward direction along said rear surface, while in the other position it inhibits a flow of said liquid in the opposite directions; and

a fluid contained in said housing, in heat exchanging relationship with said wall of the supporting frame placed in coincidence of said rear surface of the coating,

whereby the radiating energy of the sun, transferred through said plate and absorbed as heat by said liquid, causes a temperature and volume differential to be established in said liquid, said differential driving a continuous flow of said liquid towards the heat exchanging wall of said supporting frame, resulting in a heaat transfer to the fluid contained in said housing, an inverse heat transfer process being inhibited by said check valve.

4,350,146

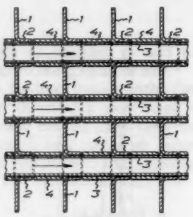
SOLAR COLLECTOR

Bengt Rosengren, Dosvagen 7, 240 21 Loddekpinge, and Christer Persson, Hyllevagen 3, 230 40 Bara, both of Sweden

Filed Aug. 29, 1980, Ser. No. 182,360

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—447 **2 Claims**



1. A solar heat collector comprising a plurality of metal plates, each having a planer first portion with a flanged hole therethrough and a planar second portion, the plane of which extends at substantially 90° with respect to the plane of the first portion; at least one tube member passing through said flanged holes to position said plates with said second portions forming a substantially continuous planar sheet, with the plane of one of said first portions and said second portions oriented substantially horizontally above at least a portion of said tube members, said at least one tube member having a cross sectional dimension at least equal to the cross sectional dimension of said flanged holes to cause said at least one tube member to be squeezed as it passes therethrough, the flanges of said flanged holes being in thermally conductive contact with said at least one tube member; and spacer means for spacing the second portions of adjacent ones of said metal plates to provide the substantially continuous planar sheet without overlapping of adjacent second portions.

4,350,147

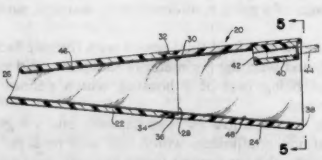
ENDOSCOPE

Robert J. Sarrine, Ann Arbor, Mich., assignor to Transidyne General Corporation, Ann Arbor, Mich.

Filed Sep. 24, 1980, Ser. No. 190,528

Int. Cl.³ A61B *1/00*

U.S. Cl. 128—4 **12 Claims**



1. An endoscope (20) comprising a hollow, conical cylinder divided into multiple sections (22), (24), each section being detachably connected (30), (32)–(36) to adjacent sections whereby to provide endoscopes of various lengths and of different size openings (26), (34) for use in engaging a presenting part (16) at different stages in the birth process, the distal end (26) of a section (22) being sloped at an angle with respect to the transverse axis of the cylinder.

4,350,148

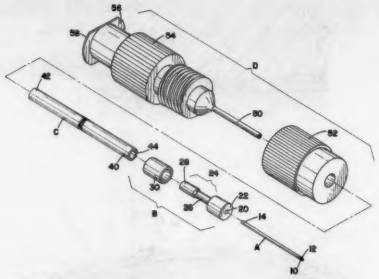
ESOPHAGEAL VARICES INJECTOR

Michael V. Sivak, Jr., Cleveland Heights, and George J. Skipper, Chagrin Falls, both of Ohio, assignors to Cleveland Clinic Foundation, Cleveland, Ohio

Filed Jan. 28, 1981, Ser. No. 229,155

Int. Cl.³ A61B *1/00*

U.S. Cl. 128—4 **7 Claims**



1. An injector comprising:

an elongated, flexible tube having an interior passage;

a tubular connector including a tubular shank frictionally received in the interior passage of the flexible tube, a stop for inhibiting the connector from passing through a puncture and an internal bore in fluid connection with the interior passage of the flexible tube;

a ferrule surrounding the end of the flexible tube and the tubular connector shank, the ferrule being firmly crimped around the end of the flexible tube; and

a needle affixed to the connector and having an internal bore in fluid connection with the connector bore; the flexible tube, the connector, and needle being dimensioned to be received in and slide through a biopsy channel of a flexible endoscope.

4,350,149

ENDOSCOPE AND ILLUMINATION OPTICAL SYSTEM THEREFOR

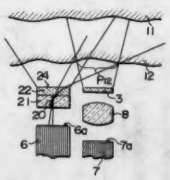
Nobuo Yamashita, Tama, and Miwako Maeda, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Jul. 10, 1979, Ser. No. 56,299

Claims priority, application Japan, Oct. 27, 1978, 53-132980

Int. Cl.³ A61B *1/06*

U.S. Cl. 128—6 **17 Claims**



1. In an endoscope, the combination comprising:

(A) an observation optical system having an observation optical axis and terminating in an observation window,

said observation optical axis extending through said observation window;

(B) a source of illuminating light; and

(C) an illumination optical system including a refractive element and first and second reflecting surfaces, said illumination optical system being positioned at a location which causes:

(1) a first portion of said illuminating light to pass through said refractive element on both sides of said first reflecting surface and to be transmitted through said illumination optical system along a first optical axis which is oblique to said observation optical axis and crosses said observation optical axis at a first point located in front of said observation window; and

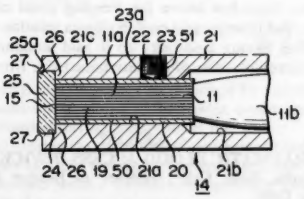
(2) a second portion of said illuminating light to reflect off said first and second reflecting surfaces and to be transmitted through said illumination optical system along a second optical axis which is oblique to said observation optical axis and crosses said observation optical axis at a second point located in front of said observation window, said first point being further from said observation window than said second point as measured along said observation optical axis whereby said first portion of illuminating light serves primarily to illuminate objects which are relatively far from said observation window and said second portion of illuminating light serves primarily to illuminate objects which are relatively close to said observation window.

4,350,150

STRUCTURE OF A LIGHT-RECEIVING END PORTION OF AN ENDOSCOPE LIGHT GUIDE

Tetsumaru Kubota, and Kenji Koyata, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1980, Ser. No. 187,545
Claims priority, application Japan, Sep. 25, 1979, 54-122936
Int. Cl.³ A61B *1/06*
U.S. Cl. 128—6 **16 Claims**



1. A structure of a light-receiving end portion of an endoscope light guide including a bundle of optical fibers comprising:

an end part of the bundle of the optical fibers having an end plane for receiving light;

an adhesive applied to the end part for fixing the optical fibers together;

a support made of a metal of good heat conductivity, and provided with a bore into which said end part of the bundle of the optical fibers is inserted and also with an annular hole open to said bore and the outside; and

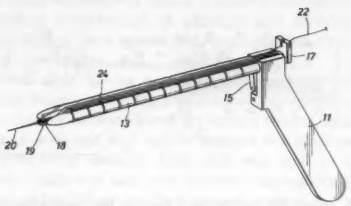
a transparent heat-resistant disc member fitted into said annular hole in a liquid tight state.

4,350,151

EXPANDING DILATOR

F. Brantley Scott, Houston, Tex., assignor to Lone Star Medical Products, Inc., Houston, Tex.

Filed Mar. 12, 1981, Ser. No. 242,720
Int. Cl.³ A61B *1/32*; A61M *3/00*
U.S. Cl. 128—17 **4 Claims**



1. In apparatus for assisting in penile implant surgery, the combination comprising:

a handle for said apparatus;

a unitary dilator supported by said handle, said dilator being split longitudinally along the full length thereof in at least two radially separable sections; and

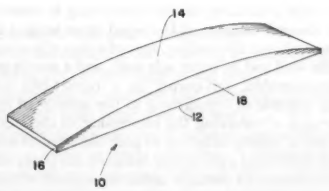
means for uniformly and positively separating said sections along substantially the entire length thereof and for securely holding and carrying an instrument along a predetermined path from one longitudinal end of said dilator to the other longitudinal end of said dilator.

4,350,152

BACK MASSAGE BOARD

Joseph Strakowski, 112 Birch Way, San Rafael, Calif. 94903

Filed Jul. 28, 1980, Ser. No. 172,521
Int. Cl.³ A61H *1/00*
U.S. Cl. 128—24 R **2 Claims**



1. A massage board having:

a planar under surface to be supported on a flat surface; and

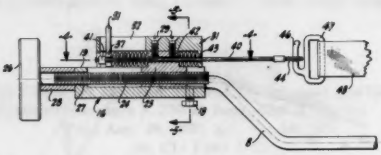
a convex smoothly curved upper surface of sufficient length and width to support the upper torso of human adult, said surface being generated by movement of a straight line along an arcuate path approaching said under surface at both ends so that said upper surface merges smoothly into said flat surface to enable one to be supported on said flat surface and roll back and forth over said upper surface without discomfort;

said board being between 18 inches and 30 inches in length and curving upward from less than ½ inch in thickness at its ends to about 2 inches in thickness at its mid-point.

4,350,153
SPLINT FOR USE WITH A HUMAN LEG

Anthony G. Borschneck, 15649 Prospect Dr., Redding, Calif. 96001

Filed Aug. 3, 1981, Ser. No. 289,776
Int. Cl.³ A61F 5/04
U.S. Cl. 128—84 C 9 Claims

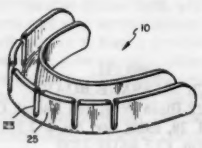


1. A splint for use with a human leg comprising a frame adapted to extend in a predetermined direction from the region of the crotch to a location beyond the foot, means on one end of said frame for abutment with the ischial tuberosity, a base block on the other end of said frame, a sliding block, means interrelating said base block and said sliding block for relative movement in said predetermined direction, means adapted to engage the leg in the ankle region, a spring structure interposed between said means engaging the leg in said ankle region and said sliding block, and means interengaging said sliding block and said base block for moving said sliding block relative to said base block to vary the tension of said spring structure.

4,350,154
TEETH PROTECTING DEVICE

Elliot V. Feldbau, 53 South St., Natick, Mass. 01760

Filed Apr. 16, 1981, Ser. No. 254,970
Int. Cl.³ A61F 5/56
U.S. Cl. 128—136 6 Claims



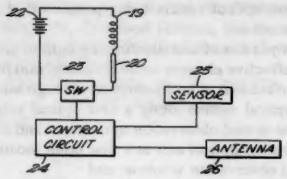
1. A teeth-protecting device comprising in combination an arcuate channel member of U-shaped cross section defined by a bottom wall and upstanding, spaced side walls comprising an inner side wall and an outer side wall, and a matrix comprising an impressionable, self-curing to a rubber-like consistency material, capable of conforming to the interior of the channel member and of receiving the impression of the teeth prior to curing and of lightly adhering to both the channel member and the teeth following curing, and wherein the outer side wall of the channel member contains arcuately-spaced, vertically-positioned slots which enable peeling the portion of the outer side wall between longitudinal slots away from the matrix to leave the matrix intact and the matrix, in turn, being peelable from the teeth.

4,350,155
BODY IMPLANTABLE MEDICAL INFUSION SYSTEM

Howard J. Thompson, New Richmond, Wis., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 2, 1980, Ser. No. 136,811
Int. Cl.³ A61M 31/00; F16K 13/04, 17/36
U.S. Cl. 128—213 R 9 Claims

1. In a body implantable medical infusion system of the type having an infusate reservoir, means for regulating infusate discharge and catheter means for delivering discharged infusate to a desired infusion site, the improvement which comprises further means for preventing an unregulated infusate

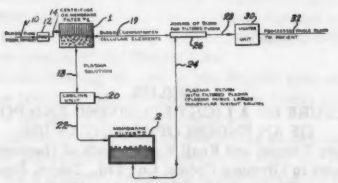


discharge including normally open valve means, means for sensing the presence of unregulated infusate and means responsive to said sensing means for closing said valve means.

4,350,156
METHOD AND APPARATUS FOR ON-LINE FILTRATION REMOVAL OF MACROMOLECULES FROM A PHYSIOLOGICAL FLUID

Paul S. Malchesky, Painesville Township, Lake County, and Yukihiko Nose, Cleveland Heights, both of Ohio, assignors to Japan Foundation for Artificial Organs, Painesville Township, Lake County, Ohio

Filed May 29, 1980, Ser. No. 154,581
Int. Cl.³ A61M 5/00
U.S. Cl. 128—214 R 32 Claims



1. A method of removing macromolecules from a plasma solution comprising; providing a plasma solution containing macromolecules including a minimum size thereof, effecting predetermined cooling of said plasma solution to a temperature not lower than just above the freezing point of the plasma solution, and filtering said cooled plasma solution with a membrane filter having a porosity up to said minimum size to remove macromolecules of predetermined size from the plasma solution.

4,350,157
ATRAUMATIC BLOOD ACCESS DEVICE VALVE

Jack Hoffa, Brea, Calif., assignor to Bentley Laboratories, Irvine, Calif.

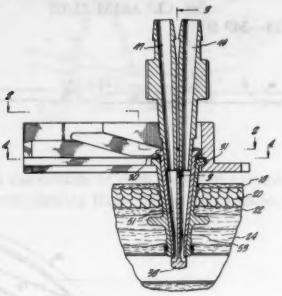
Filed Jun. 3, 1980, Ser. No. 156,259
Int. Cl.³ A61M 5/00
U.S. Cl. 128—214 R 5 Claims

3. An atraumatic valving mechanism for operation within a blood access device having an external rim, said blood access device adapted to connect a blood vessel within a body to the body exterior, said valving mechanism comprising:

a reciprocal plugging means for sealing said blood access device when said plugging means assumes a closed valving mechanism position, said plugging means including a plugging means external rim and an interior blood channel for transferring blood therethrough only when said plugging means is reciprocated into an open valving mechanism position wherein said plugging means is extended from said

blood access device for extending said first and second blood channels; and

actuator means for slidably engaging said blood access device external rim and said plugging means external rim and for



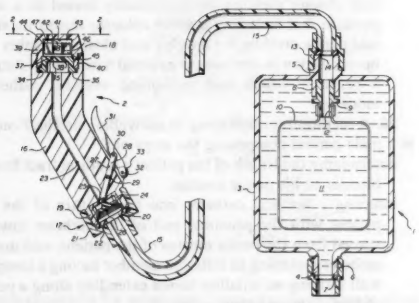
varying the position of said plugging means external rim relative to said blood access device external rim, for reciprocating said plugging means between said closed valving mechanism position and said open valving mechanism position.

4,350,158

PULSATING SPRAY NOZZLE

Raymond A. Hudson, 7415 Universal, Houston, Tex. 77072

Filed Feb. 4, 1980, Ser. No. 118,541
Int. Cl.³ A61M *3/00*
U.S. Cl. 128—224 **9 Claims**



1. A pulsating spray nozzle, characterized by steady operation throughout a wide range of flow rates, comprising

a hollow housing having fluid inlet at one end,

an end wall closing the other end of said housing and having a plurality of fluid discharge orifices therethrough in a predetermined pattern located symmetrically around the longitudinal axis of said housing,

a rotary valve member positioned in said housing for rotation along the surface of said end wall initially in contact therewith and movable toward and away from said surface, said valve member comprising cylindrically shaped rotary valve member having a cylindrical central passageway extending therethrough, a plurality of rotary vanes extending radially from said passageway and defining the outer boundary of said cylindrically shaped rotary member and a valve plate secured to and integral with only several of said vanes and positioned on one side of said rotary member over said several of said vanes,

said valve member being supported for rotation in said housing with said valve plate adjacent said end wall in sliding relation therewith and over the path in which said orifices are positioned whereby rotation of said vane member closes and opens selected orifices in said end wall sequence to effect a pulsing flow of fluid therethrough without a central axle and floating longitudinally of said housing relative to said end wall,

a second wall member in said housing between said valve member and said fluid inlet defining a chamber enclosing said valve member and having a plurality of fluid orifices extending therethrough at an angle and positioned to direct flow of fluid against said vanes to effect rotation of said vane member, and

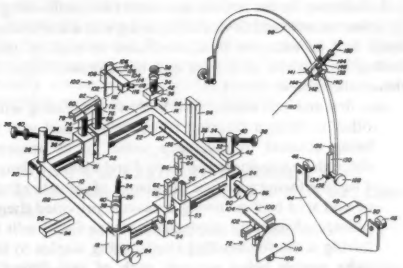
said valve plate having a surface adjacent said end wall having radially extending grooves therein permitting fluid flow radially outward along the surface thereof initially in contact with said end wall to support the same raised a predetermined distance from said end wall to permit steady rotation of said vane members throughout a wide range of fluid flow rate through said housing.

4,350,159

FRAME FOR STEREOTACTIC SURGERY

Kasim I. Gouda, 34 Sierra Rd., Readville, Mass. 02136

Filed Feb. 29, 1980, Ser. No. 125,868
Int. Cl.³ A61B *19/00*
U.S. Cl. 128—303 B **3 Claims**



1. A stereotactic instrument comprising;

a rigid body-surrounding frame having segments adapted for fixation to the left and right of the skull,

four fixation pins for securing said frame on, and rendering it motionless with respect to, the body,

a pair of individually adjustable radio-opaque markers, each having a wall or walls less than 1 millimeter thick, mounted on each of said left and right segments and adapted to be aligned with radiographically visible reference points within the skull, following fixation of the frame to the skull,

a bridge simulating outside the head the length and direction of a line between the anterior and posterior commisures of the brain, movable with respect to said frame segments, connecting each of said pairs of markers,

means for maintaining said bridges coplanar with and in spaced parallel relation to each other and to a line between said reference points within the skull,

a semi-circular arc having two ends, each pivotally mounted on one of said bridges,

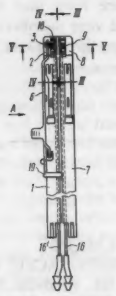
an electrode carrier slidably mounted on said arc, and

an electrode sheath supported by said electrode carrier.

4,350,160
INSTRUMENT FOR ESTABLISHING VASCULAR ANASTOMOSES

Evgeny V. Kolesov, prospekt Veteranov, 151, korpus 2, kv. 52, Leningrad; Boris A. Smirnov, ulitsa Borisa Galushkina, 17, kv. 26; Vladimir M. Fedotov, ulitsa Startovaya, 21, kv. 42, both of Moscow, and Iosif L. Lipovsky, Ozerkovsky prospekt, 7, kv. 2, Leningrad, all of U.S.S.R.

Filed Apr. 2, 1980, Ser. No. 136,736
Claims priority, application U.S.S.R., Nov. 14, 1979, 2833451
Int. Cl.³ A61B *17/04, 17/12, 17/08;* B31B *1/00*
U.S. Cl. 128—334 R 2 Claims



1. A device for use with an instrument for establishing vascular anastomoses, said device comprising a first and second split bush, and an elongate tube connected to each of said split bushes so that the split bush and its associated tube form a detachably connectable unit;

said first and said second split bushes cooperating with each other to form a suturing zone, each of said split bushes being adapted to receive a vessel to be anastomosed through an interior space thereof and having a flange with a surface facing a surface of a flange of the other bush, one of said split bushes having a passage provided therein for passage of suturing staples, the other of said split bushes having a die for bending the suturing staples to thereby unite vessels being sutured, each of said flange facing surfaces having an annular slot formed therein, lateral faces of the flanges having openings formed therein in communication with said annular slots;

a first of said elongate tubes having one end connected to the opening in the flange of the first split bush; and

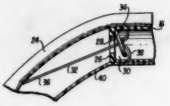
a second of said elongate tubes having one end connected to the opening in the flange of the second split bush, other ends of said first and said second tubes being connectable to a source of negative pressure, the negative pressure suction attracting and holding ends of the vessels on said flange facing surfaces;

said instrument having first and second detachably joined oblong body members, each of said detachably connectable units being connectable to a respective one of said oblong body members, each of said oblong body members having a first end portion for receiving and for mounting one of said split bushes so that said split bushes form the suturing zone when the oblong body members are joined together, each of said oblong body members having a slot formed therein for receiving a respective one of said elongate tubes so that the other end of the elongate tube extends outward from a second end portion of said oblong body member.

4,350,161
INDWELLING URETHRAL CATHETER AND METHOD

Richard C. Davis, Jr., 5828 - C Westower Dr., Richmond, Va. 23225

Filed May 9, 1980, Ser. No. 148,340
Int. Cl.³ A61M *25/00*
U.S. Cl. 128—349 BV 22 Claims



1. An indwelling urethral catheter for use in a penile urethra comprising:

a catheter drainage shaft defining an enclosed drainage canal, said catheter to extend through said penile urethra and having distal and proximal ends;

an anchoring means attached to the catheter drainage shaft for holding said drainage shaft in position in said penile urethra; and

a valve means including a valve body attached to said catheter drainage shaft for defining a valve-body canal communicating with the drainage canal and a closure member for selectively opening and closing said valve-body canal, said closure member being normally biased to a closed position, but including a valve actuator means located in said penile urethra, for moving said closure member to an open position in response to external hand manipulation of a penis in which said indwelling urethral catheter is mounted.

20. A method for implanting an indwelling urethral catheter in a male patient comprising the steps of:

determining the length of the patient's urethral tract from his bladder to his penile meatus;

inserting a urethral catheter into the urethra of the male patient with the proximal end of the catheter inwardly spaced from the penile meatus of the patient, said urethral catheter including an inflation member having a compliant wall forming an inflation lumen extending along a portion of said catheter in said urethra;

inserting a fluid in said inflation lumen for inflating said compliant wall against the wall of the patient's urethra downstream of the patient's prostatic urethra to thereby hold the catheter in position; and

removing all exterior support items from said urethra and leaving nothing extending beyond the penile meatus.

4,350,162
WOMEN'S BRASSIERS AND OTHER SIMILAR DRESS

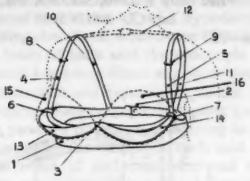
Gloria M. Kearton, and Malcolm C. Kearton, both of 27 Windermere Rd., Epping 2121, New South Wales, Australia

Filed Mar. 7, 1978, Ser. No. 884,201
Int. Cl.³ A41C *1/14*
U.S. Cl. 128—477 5 Claims

1. An unwired brassiere or like support garment comprising:

a band of material encasing the chest just below the breasts, two sling straps being attached to said band at the centre thereof, said sling straps passing one under each breast and over the corresponding shoulder thereby lifting the

breasts, said sling straps consisting of a wide flat ribbon, and having a further attachment to said band at a single



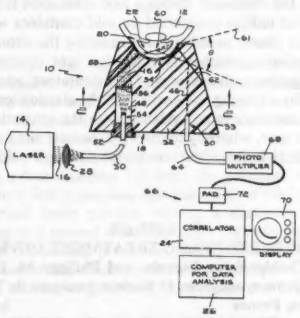
point on the outside of each breast to prevent said sling straps from slipping from their position under the breast.

4,350,163

METHOD AND APPARATUS FOR ANALYZING CONTAMINANTS IN AQUEOUS HUMOR

Norman C. Ford, Jr., 85 N. Whitney St., Amherst, Mass. 01002, and David K. Dueker, 11 Rangeley Ridge, Winchester, Mass. 01890

Filed May 29, 1980, Ser. No. 154,432
Int. Cl.³ A61B *3/00, 5/00*
U.S. Cl. 128—633 **10 Claims**



1. An apparatus for measuring contaminants in humor of an eye by non-invasive measurement of the eye, the apparatus comprising:

(a) a continuous wave laser for producing light beams of known wave length;

(b) projection means for directing and converging a light beam from the laser to a focal point in the humor, said projection means including a gonioscopic lens having a transparent housing with an opaque outer surface and an attached concave recess adapted to fit over the cornea of the examined eye, wherein the concave recess is substantially opaque except for a transparent entrance port to admit the laser beam into the humor, a transparent viewing port to permit a clinician to view scattering of the beam in the humor, and a transparent exit port to collect scattered light from the humor; and

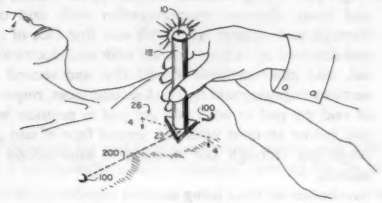
(c) means for analyzing the composition of macromolecular contaminants in the humor by analyzing the diffusion constant of each contaminant by using the light scattered from the focal point at a particular scattering angle θ relative to a line of symmetry for the beam in the humor.

4,350,164

PORTABLE, LIFE MONITOR, MEDICAL INSTRUMENT

Joseph L. Allain, Jr., 4932 Chantilly Dr., New Orleans, La. 70126

Filed Jun. 3, 1980, Ser. No. 156,056
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—639 **5 Claims**



1. A portable life monitor for use in monitoring body tissue for electrical signals, comprising:

electrode detector means for detecting such electrical signals in such tissue including electrode means having a first set of electrodes for electrically connecting said electrode detector means to such tissue;

a first body having amplifier means for amplifying such electrical signals and indicator means for receiving and displaying said amplified electrical signals;

first connection means for detachably electrically connecting said amplifier means to said electrode detector means;

a second, separate set of electrodes; and

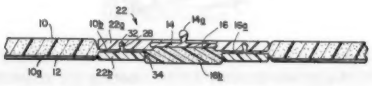
fold down means connected to said second set of electrodes for mechanically supporting said second set of electrodes on said first body in two positions, a first position being substantially parallel to said first body and a second position being substantially perpendicular to said first body; and wherein said first connection means detachably electrically connects said second set of electrodes to said amplifier means in said second position.

4,350,165

MEDICAL ELECTRODE ASSEMBLY

Jim G. Striese, Brockton, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed May 23, 1980, Ser. No. 152,945
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—640 **15 Claims**



1. A disposable medical electrode comprising:

A. a holder comprising

(1) a first generally flat holder section having

(a) an outer surface and an inner surface,

(b) means defining a recess in said inner surface, and

(c) means defining a passage extending from said recess outside said first section for providing electrical access to said recess,

(2) a second generally flat holder section having

(a) an outer surface and an inner surface and

(b) means defining an opening through said second section extending between said outer and inner surfaces thereof,

B. a support layer having first and second faces engaged by said inner surfaces of said first and second holder sections, respectively, to hold said support layer in said holder, said

support layer also including means defining an opening therethrough extending between said first and second faces, said second face of said support layer providing an adhesive surface,

C. an electrical terminal disposed in said recess in said inner surface of said first holder section for electrical access thereto through said passage in said first holder section, and

D. a gel pad having first and second opposite faces, said gel pad being disposed in registration with said opening through said support layer with said first face of said gel pad disposed in intimate contact with said electrical terminal, said inner surfaces of said first and second holder sections engaging said first and second faces, respectively, of said gel pad to hold said gel pad in position between said holder sections with said second face of said gel pad projecting through said opening in said second holder section,

said two holder sections being secured together so as to maintain said inner surfaces thereof in engagement with said support layer and said gel pad and thereby hold them in assembly.

4,350,166

APNEA DETECTOR

John W. Mobarry, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 12, 1980, Ser. No. 216,030
Int. Cl.³ A61B 5/08
U.S. Cl. 128—664 **8 Claims**

1. An apnea detector for monitoring the respiration of a monitored subject, said apnea detector comprising:

an infrared radiation detector means;

means for defining a field of view for said radiation detector means, said field of view defining means being arranged to include an area of said monitored subject in said field of view containing exhalation products from said monitored subject;

mounting means positioning said radiation detector means spaced from said monitored subject in a non-contacting relationship to be responsive to modulations of ambient infrared radiation produced by exhalation products from said monitored subject to produce a corresponding modulation signal; and

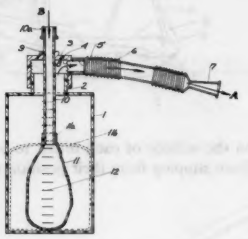
alarm means responsive to a prolonged interruption of said modulation signal produced by an interruption of the respiration of said monitored subject to effect an alarm signal indicative of apnea.

4,350,167

RESPIRATORY EXERCISER

Henry J. Heimlich, 17 Elmhurst Pl., Cincinnati, Ohio 45208

Filed May 9, 1980, Ser. No. 148,510
Int. Cl.³ A61B 5/08
U.S. Cl. 128—727 **4 Claims**



1. A respiratory exercising device comprising:

an essentially rigid transparent container,

a first orifice in communication with the interior of the container,

an inhalation tube connected to said first orifice,

a second orifice in said container in communication with the outside air,

an expansible chamber consisting of an elastic member located within said container and connected to said second orifice to communicate said expansible chamber to the outside air, said elastic member being of a size to expand within the confines of the container to conform to the contiguous wall surfaces thereof upon evacuation of air from the container through said inhalation tube,

calibrated indicia positioned on said container with respect to said elastic member for measuring the extent to which said elastic member is expanded into contact with the contiguous wall surfaces of the container, and

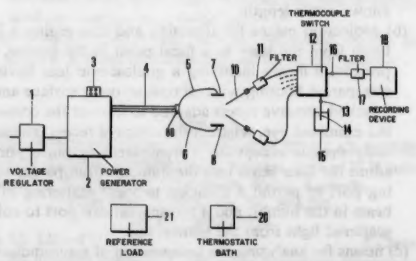
means for adjusting the position of the elastic member within said container in accordance with the inhalation capacity of the user, whereby to directly measure the volume of air withdrawn from the container through said inhalation tube.

4,350,168

HYPERTHERMIC TREATMENT DEVICE

Yves A. Chable; Serge Lacroix, and Philippe M. Rault, all of Dinan, France, assignors to Societe Anonyme de Telecommunications, France

Filed Jun. 23, 1980, Ser. No. 162,245
Claims priority, application France, Feb. 8, 1980, 80 02752
Int. Cl.³ A61B 5/00
U.S. Cl. 128—736 **2 Claims**



1. A device for measuring the temperature of a tumor in a patient'body during heating of the tumor by external applica-

tion to the tumor of a radiofrequency power, which comprises n thermocouples for measuring the temperature at a point inside the patient's body, each said thermocouple having two output leads, n hypodermic needles, and each said thermocouple being placed inside one of said hypodermic needles with the leads exiting therefrom, n band-stop filters, each of the said two output leads of each said thermocouple being connected to one of said band-stop filters as near as possible to the exit of the leads from each said hypodermic needle, a switching and temperature comparison means for selecting a said thermocouple inside the patient's body and comparing its output to a reference thermocouple, the output of each said filter being connected to the input of said switching and temperature comparison means, a low-pass filter connected to the output of said switching and temperature comparison means for enabling correct measurement of the temperature of the tumor without interrupting the application of said radiofrequency power, and a recorder connected to the output of said low-pass filter for recording said temperature.

4,350,169

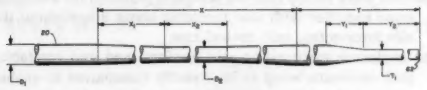
FLEXIBLE TIP STIFFENING STYLET FOR USE WITH BODY IMPLANTABLE LEAD

Robert G. Dutcher, Columbia Heights, and James E. Upton, New Brighton, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 1,203, Jan. 5, 1979, abandoned. This application Aug. 8, 1980, Ser. No. 176,410

Int. Cl.³ H61N *1/00*

U.S. Cl. 128—783 **11 Claims**



1. A stylet for insertion into the proximal opening in the lumen of a hollow vessel to manipulate rotatable means attached to the distal end of said lead, said stylet comprising:

means for manipulating said rotatable means attached to the distal end of said stylet;

a cylindrical body portion, said cylindrical body portion having a first diameter D1 from the proximal end of said stylet to a first point near the distal end of said stylet, said cylindrical body portion having a diameter gradually tapering to a second lesser diameter D2 between said first point and a second point and having said lesser diameter D2 between said second point and a third point, the diameter of said stylet gradually increasing to a larger diameter; and

means for rotating said stylet attached to the proximal end of said stylet.

4,350,170

APPARATUS FOR MONITORING THE EXTERIOR OF A MOVING CIGARETTE ROD OR THE LIKE

Anton Baier, Wentorf, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. K.G., Hamburg, Fed. Rep. of Germany

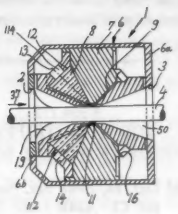
Filed Sep. 29, 1980, Ser. No. 192,345

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1979, 2940408

Int. Cl.³ A24C *5/14, 5/34*

U.S. Cl. 131—84 R **18 Claims**

1. Apparatus for monitoring the exterior of rod-shaped smokers' products which move lengthwise, comprising first light conducting means defining a first light path making a first oblique angle with a line perpendicular to the axis of the moving product; means for admitting light to said first light conducting means so that light which passes through said first light conducting means impinges upon and is reflected by the exterior of the moving product at a second oblique angle which is a function of said first oblique angle; second light conducting means located in the path of and arranged to conduct light which is reflected by the moving produce; and an



annular housing for said light conducting means, said housing having a substantially axially extending opening for the moving product.

4,350,171

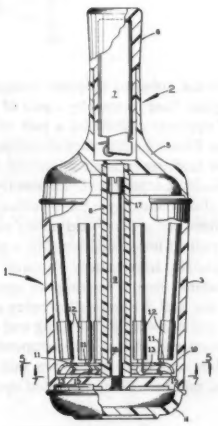
ARRANGEMENT FOR HOLDING CIGARETTES

Alexander Kemmel, 2300 Madison St., Apt. 202, Hollywood, Fla. 33020

Filed Oct. 14, 1980, Ser. No. 196,872

Int. Cl.³ A24F *19/10*

U.S. Cl. 131—234 **7 Claims**



1. A cigarette dispenser comprising:

a container in the shape of a wine bottle and having a lower annular member terminating at its upper end in an upwardly-facing annular edge, and a separate upper annular member terminating at its lower end in a downward-facing annular edge which releasably engages said upwardly-facing annular edge of said lower annular member, said upper annular member at its upper end presenting an upwardly extending neck of substantially smaller diameter than its downwardly-facing annular edge;

a holding disc received in said lower annular member of the container and movable vertically therein;

means rigidly coupling said upper annular member of said container to said disc to raise and lower said disc along the inside of said lower annular member when said upper annular member is raised and lowered with respect to said lower annular member;

a plurality of tubular cigarette holders mounted on said disc and extending up from the disc, each of said tubular hold-

ers being open at the top and shaped and dimensioned to hold the lower end of an individual cigarette;

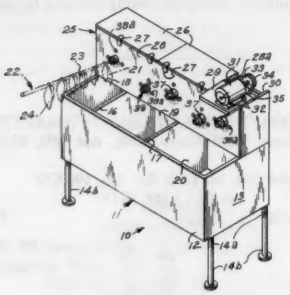
and spring means acting on said disc holders to tilt their upper ends laterally outward when said disc is raised to the upper end of said lower annular member.

4,350,172

TOBACCO STRIPPER

James Guthrie, Guthrie Farm Service, King St., Eminence, Ky. 40019

Filed Oct. 24, 1980, Ser. No. 200,564
Int. Cl.[3] A24B 3/00, 3/07
U.S. Cl. 131—322 2 Claims



1. A mechanical tobacco stripper, comprising, in combination, a rectangular base formed by a pair of opposite side walls and a pair of opposite end walls, a pair of vertical partitions inside said base forming a plurality of compartments inside said base, a narrow housing secured upon said base, covering one end of each said compartment, an electric motor mounted upon the top of said housing, a pulley affixed on a shaft of said motor, an endless belt around said pulley and around a plurality of driving pulleys inside said housing, a plurality of horizontal tubes extending transversely through said housing and supported rotatably free in bearings of opposite side walls of said housing, one said driving pulley being affixed on each one of said tubes, one outwardly extending end of said tubes being above a top open end of said compartments, a circular cutter mounted within said tube end above said compartment top open ends, and said base being mounted upon downward legs.

4,350,173

FILTER MATERIAL

Matti J. Siren, Gartenstrasse 15, CH-8002 Zürich, Switzerland

Filed Nov. 27, 1979, Ser. No. 97,703
Claims priority, application Finland, Nov. 30, 1978, 783678; Sweden, Dec. 15, 1978, 7812935
Int. Cl.[3] A24D 3/02, 3/08, 3/10, 3/12
U.S. Cl. 131—332 22 Claims

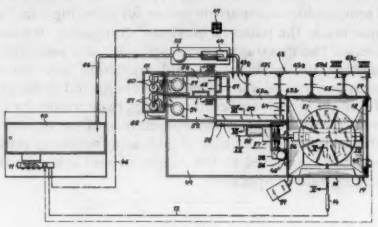
1. Filter material for removing at least one predetermined substance from an at least substantially gaseous medium, wherein said filter material comprises a carrier material comprising a cross-linked carbohydrate polymer, which is swellable to a predetermined degree and has the form of a microporous network having through-passing pores defined by the cross-linked carbohydrate molecule structures, said carrier material having uniformly distributed therein at least one agent capable of removing said substance in a substantially selective manner from the medium passing through said filter.

4,350,174

PLANT FOR CLEANING CASTINGS AND THE LIKE

Michael Bolten, Mulhheim an der Ruhr, Fed. Rep. of Germany, and Henry L. Carpenter, Edison, N.J., assignors to Woma Corporation, South Plainfield, N.J.

Filed Feb. 25, 1981, Ser. No. 238,129
Int. Cl.[3] B08B 3/02
U.S. Cl. 134—104 10 Claims



1. A plant for cleaning intricate metallic workpieces, comprising:

a turntable adapted to hold a workpiece to be cleaned in a fixed position thereon, said turntable being provided with a central shaft;

first drive means coupled with said shaft for rotating said turntable about a central axis;

a nonrotatable platform supporting said turntable;

second drive means coupled with said platform for swinging same together with said turntable about a horizontal tilt axis intersecting said central axis;

an enclosure surrounding said platform and said turntable, said enclosure being at least partly transparent to enable viewing of said turntable and said workpiece by an outside operator;

a water gun universally jointed in a wall of said enclosure for manipulation by the operator to train a high-pressure jet upon said workpiece;

control means within reach of the operator outside said enclosure for selectively actuating said first and second drive means;

a high-pressure pump with an inlet connected to a water supply and with an outlet connected to said water gun; and

a collector underneath said turntable for catching spent water and accompanying detritus.

4,350,175

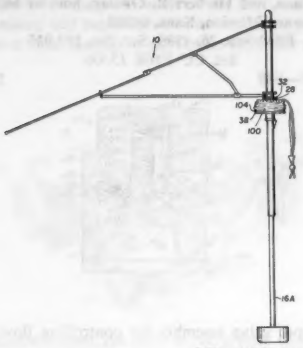
FOLDING UMBRELLA

Joseph H. DeMarco, 60 Seaman Ave., New York, N.Y. 10034

Continuation-in-part of Ser. No. 74,393, Sep. 10, 1979, abandoned. This application Sep. 24, 1980, Ser. No. 190,471
Int. Cl.[3] A45B 25/18, 25/24
U.S. Cl. 135—33 C 1 Claim

1. In a folding umbrella of the type having a central rod and circumferentially spaced ribs hingedly connected adjacent the top of said rod, each of said ribs being further hinged at a medial location therealong and operationally disposed to fold bodily upon itself during the folding of said umbrella into a compact storage condition, the improvements to such folding umbrella serving as an integral cover for same comprising a slide member slidably disposed on said central rod, said slide member having a hinge-supporting structure adjacent the upper end thereof for completing hinge connections to said ribs and a centrally positioned panel disposed thereon in a clearance position below said hinge-supporting structure, and a fabric tube connected in encircling relation about said slide between said hinge-supporting structure and said panel, whereby said fabric tube is in an out-of-the-way position dur-

ing use of said umbrella and during non-use thereof is advantageously positioned to be pulled in covering relation up over



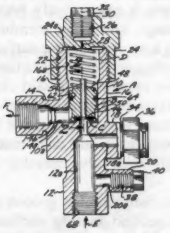
said bodily folded to thereby contribute to providing a protective cover for said umbrella.

4,350,176

CHECK VALVE STRUCTURE

Donald A. Lace, 5041 Galway Cir., Huntington Beach, Calif. 92649

Filed Aug. 18, 1980, Ser. No. 178,791
Int. Cl.[3] B08B *1/00*; F16K *15/00, 17/04*
U.S. Cl. 137—242 **17 Claims**



1. A self cleaning check valve that permits fluid that may have solid particles entrained therewith to flow from a first zone to a second zone when the pressure on fluid in said first zone exceeds a predetermined magnitude, said check valve including:

a. a valve body that has first and second passages and an elongate confined space defined therein that communicate with one another, said first passage and confined space axially aligned, a circular valve seat of semi-circular transverse cross section inside said body in which said first passage terminates, and said first and second passages in communication with said first and second zones;

b. (a) an elongate cylindrical valve member slidably movable in said confined space, said valve member having first and second ends, said first end partially defined by a circular rib of hook shape transverse cross section, said rib having a transverse passage therein, and a circumferential recess on the exterior of said valve member that communicates with said passage;

c. a head supported from said first end and situated within and radially spaced from said rib, said head defined by a generally cylindrical sidewall and an end face that intersect to provide a circular knife edge of such diameter that said knife edge is centered on said valve seat when said valve member is in a first position, said head formed from a rigid material harder than said particles, and said knife edge either severing or displacing those of said particles deposited on said valve seat when said valve member is in said first position;

d. deformed spring means in said confined space that maintain said valve member in said first position until the pressure of fluid of said predetermined magnitude in said first zone exerts a force on said face of said head that is greater than the force exerted by said spring means on said valve member; and

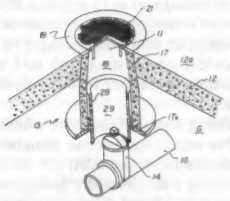
e. a first resilient sealing ring that grips said side wall and is disposed in a circumferential space defined on said first end of said valve member between said rib and side wall of said head, said valve member due to said recess having a dynamic lift imparted thereto that disposed said valve member at a second position substantially within said confined space where said sealing ring is exposed to a minimum abrasive action by said particles when said fluid flows at high velocity through said first passage, valve seat and second passage upon said fluid in said first zone exceeding said predetermined magnitude in pressure, with said valve member being moved by said spring means from said second to said first position when said pressure of said fluid in said first zone falls below said predetermined magnitude, with pressurized fluid in said second zone after said valve member returns to said first position flowing into said recess and through said passage into said circumferential space to exert an inwardly directed pressure on said first sealing ring to increase the force that urges said first sealing ring into sealing contact with said valve seat.

4,350,177

UTILITY BOX SUPPORT

John C. Firchau, 6315 Edgewood Way, Rocklin, Calif. 95677, and Morris L. Donaldson, 233 Sierra Blvd., Roseville, Calif. 95678

Filed May 12, 1980, Ser. No. 148,839
Int. Cl.[3] E02D *29/10*
U.S. Cl. 137—370 **3 Claims**



1. A utility box and support comprising in combination:

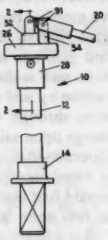
an annular member, substantially circular in shape having planar parallel upper and lower surfaces and a central opening,

an upstanding annular flange formed integrally with said annular member having a circular central opening flush with said member opening and dimensioned to leave a peripheral portion of said planar upper surface exposed which supports the utility box formed as a tubular housing having a bottom edge surface disposed atop said planar top surface whereby an interior of said tubular housing is in registry with said central opening and constrained from radial displacement by a snug fit over said flange, said housing including a grade ring on a top edge surface thereof coplanar with a traffic bearing surface.

4,350,178
BALL COCK ASSEMBLY

Merritt J. Nelson, 857 Indian Lakes Rd., NW., Sparta, Mich. 49345, and Merritt S. Nelson, 7000 Kreuter Rd., NE., Belmont, Mich. 49306

Filed May 15, 1981, Ser. No. 263,870
Int. Cl.[3] F16K *31/26, 33/00*
U.S. Cl. 137—444 9 Claims

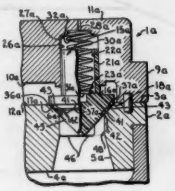


1. A ball cock assembly comprising:
a water supply pipe disposed in a fill tank;
a valve housing mounted to said water supply pipe, said housing including an inlet in communication with said water supply pipe, outlet means for communicating fluid to said fill tank and a central passage communicating said inlet with said outlet means;
said central passage having a first chamber of a selected diameter above said outlet means, a second chamber of a diameter less than the diameter of said first chamber and upstream of and below said first chamber, and valve seats disposed in each of said first and second chambers;
a float-operated valve member mounted for reciprocation in said central passage so as to regulate flow from said inlet to said outlet means, said valve member having
means defining an upwardly facing, first piston surface, a first shoulder cooperating with said valve seat in said first chamber to seal said first chamber from said second chamber;
means defining a second shoulder which cooperates with said valve seat in said second chamber to seal said second chamber from said inlet;
means defining a downwardly facing, second piston surface upstream of said first piston surface, said second piston surface having an area less than that of said first piston surface;
orifice means in said valve member for communicating fluid from said inlet to said first chamber so as to provide a fluid pressure in said first chamber against said first piston surface;
port means on said valve member for regulating flow from said inlet to said outlet means, said port means being selectively aligned with said outlet means during reciprocation of said valve between open and closed positions; and
a float connected with said valve member and disposed in said fill tank, said float providing a biasing force for closing said valve member as the fluid level in the tank rises;
whereupon a gradual closing of the valve member is provided by the differential fluid pressure acting against said first and second piston areas until said first and second shoulders are seated against their respective valve seats.

4,350,179
VALVE ASSEMBLY WITH RELIEF GROOVE

Stuart E. Bunn, and Herbert B. Owsley, both of 6412 Carter Ave., Shawnee Mission, Kans. 66203

Filed Sep. 26, 1980, Ser. No. 191,015
Int. Cl.[3] F16K *15/06*
U.S. Cl. 137—540 17 Claims



7. A poppet valve assembly for controlling flow of fluid under pressure comprising:
(a) a passage through said poppet valve assembly for fluid flow:
(b) a seat member having an inlet portion of said passage extending therethrough and a seat face with a first mating surface surrounding said passage inlet portion;
(c) a cage member positioned in spaced relation to said seat member whereby an outlet portion of said fluid flow passage is defined between said cage and seat members for receiving fluid from said passage inlet portion, said cage member having a guide bore therein;
(d) a valve member movably mounted with respect to said seat member between a closed position and an open position whereby fluid flow is respectively prevented and allowed through said passage, said valve member including:
(1) a head having a second mating surface for engaging said first mating surface to define a contact area therebetween when said valve member is in said closed position; and
(2) a valve stem extending from said valve member head and slidably positioned within said guide bore;
(e) resilient means engaging said cage member and said valve member for urging said valve member to said closed position; and
(f) relief means comprising a relief groove extending along one of said first and second mating surfaces from an interior portion of said contact area to a periphery of said contact area; said relief groove communicating fluid from said passage with an inner portion of said contact area for operably reducing a force required to disengage said mating surfaces and move said valve member to said open position; and
wherein:
(g) said first and second mating surfaces are uninterrupted by said relief groove over a continuous circumferential portion of said contact area whereby flow of fluid through said passage is prevented when said valve member is in the closed position thereof.

4,350,180
TENSION CONTROL SYSTEM

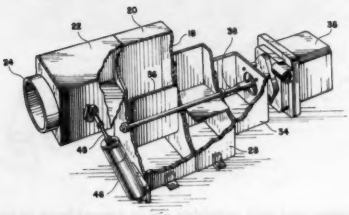
Odell D. Crittenden, 5700 W. Mercer Way, Mercer Island, Wash. 98040

Filed Jun. 10, 1980, Ser. No. 158,287
Int. Cl.[3] F16K *31/04;* B65H *23/08*
U.S. Cl. 137—596.17 5 Claims

2. A control device for use with a machine requiring a constant flow of air at a critical pressure different from that of the atmosphere wherein the flow is transmitted from a general source by means of a conduit, said device comprising:
means to provide a constant flow of air;
conduit means interconnecting the control device and the source of airflow;
a first chamber in communication with an opening in the machine and with the conduit;

a second chamber in connection with the same opening in the machine and with the atmosphere;

butterfly valve means in each of the first and the second chambers, said butterfly valve means mounted to a single control shaft normal to each other such that when one is



completely open, the other is completely closed, and said valves are infinitely adjustable to control the fluid flow;

means for adjusting the valve positions to control the flow; and

means to instantly terminate the flow of air whereby the machine may be immediately shut down.

4,350,181

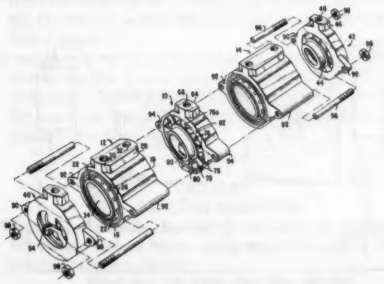
VALVE COUPLING MEMBER

Bruce K. Kreeley, Bristol, Pa., assignor to The Singer Company, Stamford, Conn.

Filed Apr. 6, 1981, Ser. No. 251,630

Int. Cl.³ F16L *37/28*; F16K *31/126*

U.S. Cl. 137—614 **5 Claims**



1. A coupling member adapted for joining in tandem a pair of axial flow valve bodies each of the type having a first end, a second end, a cylindrical opening extending from said first end to said second end, said cylindrical opening defining the interior of said valve body, at least one first open channel extending from said first end to said valve body interior and at least one second open channel extending from said valve body interior to said second end, and a flexible tubular sleeve located within said cylindrical opening, said coupling member comprising:

a central hub region;

sealing means on said central hub region for sealing the interior of each of the sleeves of said valve bodies from the open channel of the corresponding one of said valve bodies; and

means for providing a fluid path between the first open channel of one of said valve bodies and the second open channel of the other of said valve bodies.

4,350,182

OPERATING EQUIPMENT FOR GATE VALVES (PASSAGE VALVES)

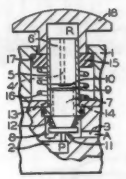
Helmut Gottling, Isernhagen, and Rudolf Moller, Gehrden, both of Fed. Rep. of Germany, assignors to WABCO Steuerungstechnik GmbH & Co., Hannover, Fed. Rep. of Germany

Filed Nov. 24, 1980, Ser. No. 209,432

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1979, 2949424

Int. Cl.³ F16K *31/06*

U.S. Cl. 137—625.27 **4 Claims**



1. A valve device having at least one inlet, at least two outlets, and valve means having a first position for interrupting fluid pressure communication between said one inlet and one of said outlets, while concurrently establishing fluid pressure communication between said one outlet and the other of said outlets, and a second position for establishing fluid pressure communication between said one inlet and said one outlet, while concurrently interrupting fluid pressure communication between said one and said other of said outlets, said valve device further comprising:

(a) a bushing carried in the housing of said valve device;

(b) said valve means including

(i) a stationary valve member fixed in said bushing; and

(ii) a movable valve member operably disposed in said bushing to move axially therein relative to said stationary member;

(c) a first spring means for biasing said movable member in a direction to establish said first position of said valve means;

(d) magnetic means operably disposed in surrounding relationship with said bushing for exerting a magnetic force on said movable valve member in opposition to said first spring means;

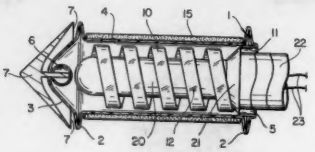
(e) second spring means for urging said magnetic means toward an inactive position adjacent said stationary member, in which the magnetic force acting on said movable valve member is less than the biasing force of said first spring means; and

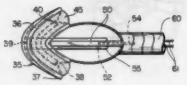
(f) actuator means operative in response to an actuating force thereto for axially displacing said magnetic means in opposition to said second spring means from said inactive position to an active position in which the magnetic force acting on said movable member is greater than the biasing force of said first spring means to thereby effect shifting of said movable valve member toward engagement with said stationary valve member with snap action to establish said second position of said valve means, said magnetic force on said movable member in said active position of said magnetic means being less than the force exerted thereon by said second spring means, so that upon release of the actuating force on said actuator means, said second spring means is effective to reset said magnetic means to said inactive position.

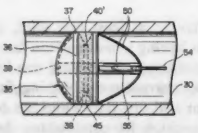
4,350,183
HEAT-RECOVERABLE PIPELINE TERMINATION PLUG

James C. Holmes, San Francisco, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed May 19, 1980, Ser. No. 150,840
Int. Cl.³ F16L 55/10
U.S. Cl. 138—89 3 Claims







1. A heat-recoverable pipeline plug comprising:

a. a polymeric diaphragmal housing which is generally concavo-convex in shape and whose outer peripheral edge defines a trough;

b. a heat recoverable metal spring integrally molded within said diaphragmal housing and which expands towards the inner wall surface of the pipeline when heated to its memory transition temperature to flatten the diaphragmal housing to a generally disc shape; and

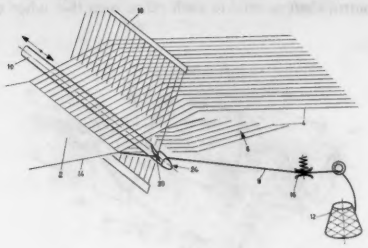
c. an adhesive sealing means contained within said trough and which is brought into contact with the inner walls of the pipeline by the force of the expanding spring to produce a seal.

4,350,184
SHUTTLELESS WEAVING MACHINE

Jakob Müller, Kehristenstrasse 23, CH-6362 Stansstad, Switzerland, and Ferdinand Diesner, Spittelweg 1, D-7887 Murg-Hänner, Fed. Rep. of Germany

Filed Mar. 18, 1980, Ser. No. 131,367
Claims priority, application Switzerland, Mar. 29, 1979, 2947/79
Int. Cl.³ D03D 47/20
U.S. Cl. 139—448 14 Claims

1. In a shuttleless weaving machine in which successive sheds are formed in the warp, means supplying a weft yarn, a movable weft yarn inserter for inserting the weft yarn into the successive warp sheds, a reed, and a cutting device on said inserter, said inserter including a housing, a replaceable cartridge insertable therein, said cartridge including a clamping device for receiving and gripping the weft yarn to be inserted into said inserter, said housing being formed with a housing slot, said cartridge being formed with a cartridge slot, said housing slot being in alignment with said cartridge slot when

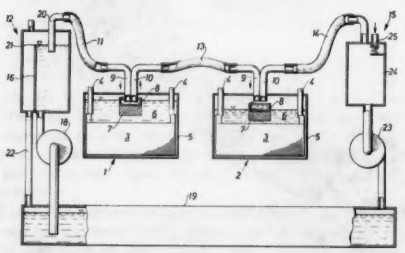


said housing and said cartridge are in assembly so as to form a slot for receiving the weft yarn from said supplying means.

4,350,185
LIQUID REPLENISHMENT SYSTEM FOR ACCUMULATOR CELLS

Kaj Quist, Nol, Sweden, assignor to AB Tudor, Nol, Sweden

Filed Dec. 16, 1980, Ser. No. 216,912
Claims priority, application Sweden, Dec. 20, 1979, 7910526
Int. Cl.³ B65B 3/04; B67C 3/16
U.S. Cl. 141—35 6 Claims

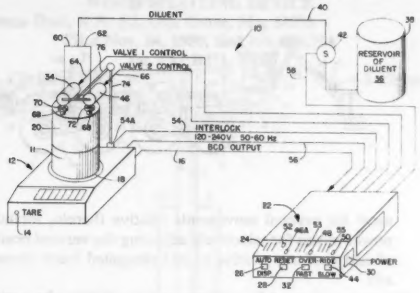


1. A liquid replenishment system for a plurality of accumulator cells comprising a central supply of battery liquid and a suction device for generating a negative pressure, said accumulator cells being disposed above said central supply and interconnected in series between the central supply and the suction device by means of air-tight inflow and outflow conduits for battery liquid in each cell, whereby the liquid is induced to flow into each of the cells by the negative pressure and means in each cell for permitting the liquid to flow into and out from the cell when the liquid level therein is normal, the improvement wherein a replenishment container for battery liquid is connected in series between the central supply and the cells at a height such that the liquid level in the container is substantially above that of said central supply and generally the same as that of the electrolyte liquid in the cells, means separate from said suction device for inducing a flow of electrolyte from said central supply to said replenishment chamber and means for limiting the negative pressure in the system.

4,350,186
GRAVIMETRIC DILUTER

Samuel Schalkowsky, Chevy Chase, Md., and Donald Whitley, Bingley, England, assignors to Spinal Systems Inc., Cincinnati, Ohio

Filed Feb. 9, 1981, Ser. No. 232,531
Int. Cl.³ B65B *3/28*
U.S. Cl. 141—83 **7 Claims**



1. An apparatus for diluting a sample within a container to a dilution factor f by weight of diluent comprising:

(a) means for repeatedly measuring the weight W of the sample plus any diluent within the container;

(b) means for choosing a dilution factor f by weight of a diluent to be used for diluting the sample;

(c) means for calculating TW wherein TW = W/f and W is the weight of the sample within the container prior to the addition of diluent;

(d) means for calculating TW − W;

(e) fluid conducting means disposed between a reservoir of diluent and the container for permitting the diluent to flow from the reservoir to the container for the purpose of diluting the sample within the container to the selected dilution factor f; and

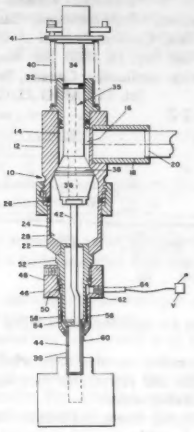
(f) means responsive to the means for calculating TW − W for controlling the flow of diluent between the reservoir and the container to cause diluent to flow between the container and the reservoir when TW > W and to stop the flow of diluent when TW = W.

4,350,187
FILLING MACHINE

William H. Trusselle, Braintree, and John A. Gustafson, Jr., Wollaston, both of Mass., assignors to Pneumatic Scale Corporation, Quincy, Mass.

Filed Jun. 25, 1980, Ser. No. 162,899
Int. Cl.³ B65B *3/04;* B08B *3/02*
U.S. Cl. 141—90 **5 Claims**

1. In a filling machine, the combination with a filling head provided with a product nozzle and a container support, so arranged as to enable positioning the nozzle within the open top of the container during the filling operation and separating the nozzle and container from each other following the filling operation of means associated with the filling nozzle operable when the latter is separated from the container to clear the external surface of the nozzle of product adhering to said external surface, said means comprising a manifold block positioned about the nozzle in axially fixed relation thereto, said manifold block defining an annular chamber closed at the top and an axially-elongate annular passage extending downwardly from the bottom of the chamber about the nozzle, in concentric relation thereto, the annular passage defining a second nozzle surrounding the product nozzle through which the scavenging fluid delivered under pressure to the chamber is projected forcibly and exclusively downwardly on the external surface of the nozzle and means defining a port in the manifold which enters the manifold radially with respect to the vertical

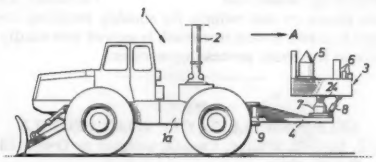


axis of the product nozzle through which a scavenging agent can be delivered under pressure into the chamber.

4,350,188
MOBILE MACHINE FOR PROCESSING TREES AND TRUNKS

Bertil Adolfsson, Umea, Sweden, assignor to Kockums Industri AB, Soderhamn, Sweden

Continuation of Ser. No. 807,188, Jun. 16, 1977, abandoned. This application Jul. 9, 1979, Ser. No. 55,754
Claims priority, application Sweden, Jul. 17, 1976, 7606949; Sep. 3, 1976, 7609771
Int. Cl.³ A01G *23/08;* B27L *1/00*
U.S. Cl. 144—2 Z **18 Claims**



1. A mobile tree processor having a mobile carrier vehicle with a vertical center plane and carrying wheels at the sides thereof, a tree processing apparatus carried on said vehicle and tree collecting means pivotally mounted on said vehicle for gripping and feeding trees to the tree processing apparatus, the improvement comprising means to increase the lateral stability of the vehicle and counter-balance the weight of the tree collecting means including power operated means on said carrier vehicle to shift the tree processing apparatus on said carrier vehicle in such a manner that the center of gravity of said apparatus is moved in either lateral direction from said vertical center plane to an outboard position at least in line with said carrying wheels so as to counter-balance the weight of the tree collecting means.

4,350,189

APPARATUS AND METHOD FOR DEBRANCHING FELLED TREES

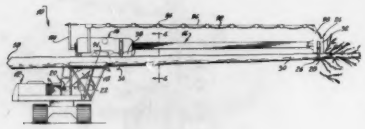
Ghislain Duchesne, Metabetchouan, Canada, assignor to Lar Machinerie Inc., Quebec, Canada

Filed Sep. 18, 1980, Ser. No. 188,285

Claims priority, application Canada, Sep. 12, 1980, 360164

Int. Cl.³ A01G *23/02*

U.S. Cl. 144—2 Z **9 Claims**



1. Apparatus for debranching a felled tree comprising:

a vehicle;

a boom processing member supported on said vehicle;

an extendable and retractable longitudinal boom mounted through said member;

first tree gripping means and debranching means mounted at one end of said boom and arranged to grasp a felled tree trunk and to remove branches therefrom;

second tree gripping means mounted to said boom processing member for grasping the tree trunk adjacent its butt end after said felled tree trunk has been grasped by said first tree gripping means and said boom retracted in said member to bring said butt end to said second tree gripping means, the longitudinal axis of said tree held by said first and second tree gripping means being substantially parallel to the axis of said longitudinal boom; said second gripping means holding said tree trunk as said boom is fully extended and said debranching means move along said tree;

means on said boom processing member for pivoting said second tree gripping means laterally so as to move said butt end away from said member and to position said tree at an angle with respect to the longitudinal axis of said boom to allow rearward retracting of said tree trunk as said boom is retracted with said first gripping means in grasping arrangement and said second gripping means being subsequently brought in grasping engagement with said tree trunk and said boom extended to effect an additional debranching length of said tree trunk by said debranching means; and

guide means on said vehicle for slidably receiving thereon said butt end as said tree trunk is moved rearwardly relative to the boom processing member.

4,350,190

SELF PROPELLED, OFF ROAD VEHICLE

Bruce J. McColl, Whitby, Canada, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 934,457, Aug. 17, 1978, Pat. No. 4,237,994, and a continuation-in-part of Ser. No. 934,458, Aug. 17, 1978, Pat. No. 4,267,956, and a continuation-in-part of Ser. No. 934,459, Aug. 17, 1978, Pat. No. 4,223,904, and a continuation-in-part of Ser. No. 18,080, Mar. 6, 1979, abandoned. This application Jun. 2, 1980, Ser. No. 155,901

Int. Cl.³ A01G *23/08*

U.S. Cl. 144—3 D **26 Claims**

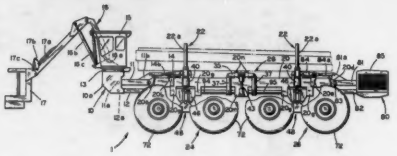
14. Apparatus for transporting whole trees over natural terrain, comprising, in combination:

(1) an elongated frame element of a length at least equal to that of the trees to be transported;

(2) a plurality of tree retaining cradles transversely mounted on said frame element;

(3) a pair of quad wheel assemblies, each assembly including a primary mounting member pivotally attached to said frame element for movement about a roll axis parallel to the longitudinal axis of the elongated frame element, a pair of walking beams having their medial portions respectively pivotally attached to opposite transverse sides of said primary mounting member for movements about a transverse pitch axis and a wheel steerably mounted on the free end of each walking beam, whereby said wheels may conform to irregularities in the terrain traversed;

(4) an operator's platform having linkage means pivotally connecting same to one end of said elongated frame element for vertical movements relative thereto, including power means for selectively adjusting the vertical position of said platform relative to said elongated frame element; and



(5) power operated linkage means for adjusting the position of said elongated frame element about said roll axis, thereby adjusting the position of the operator's platform, permitting same to be substantially horizontal when the vehicle wheels are positioned on the side of a slope.

4,350,191

ARRANGEMENT FOR CUTTING WOOD INTO CHIPS

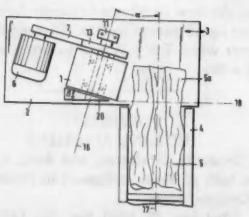
Reinhold Riedl, Gensingen, Fed. Rep. of Germany, assignor to Hombak Maschinenfabrik GmbH u. Conkg, Bad Kreuznach, Fed. Rep. of Germany

Filed Jul. 11, 1979, Ser. No. 56,786

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1978, 28297258

Int. Cl.³ B27C *1/00*

U.S. Cl. 144—172 **9 Claims**



1. An arrangement for cutting wood into chips comprising an elongated support component for supporting an elongated workpiece with an end portion of said workpiece projecting beyond one end of said support component; a tool component rotatable about an axis and having a circumferential cutting face and axial end faces one of which is directed towards said one end of said support component; means mounting one of said components movable relative to said other component along a predetermined path so that during movement of said components relative to each other said tool component will cut the end portion of the workpiece projecting beyond said one end of said support component into chips while leaving at the remainder of the workpiece a cut end face parallel to said path, at least the one end face of the tool component which is directed towards said one end of said support component includes with a plane including said cut end face a fixed acute angle so that a wedge-shaped space is developed between said one end face of the tool component and the cut end face of the

workpiece; bearing means at both end faces of said tool component supporting the latter for rotation about said axis, one of said bearing means being located entirely in said wedge-shaped space, so that said one bearing means will not interfere with the movement of said components relative to each other during cutting of said end portion of said workpiece into chips.

4,350,192

WOOD SPLITTING DEVICE

Thomas Dent, R.R. #3, Oak Grove, Mo. 64075

Filed Nov. 24, 1980, Ser. No. 209,734
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—193 C 3 Claims

1. A tool of the character described, comprising, in combination:

(1) an elongate, straight shaft of substantially uniform transverse, cross-sectional size and shape along the length thereof having an upper and a lower end,

(2) said shaft, in normal working position, extending substantially vertically and having an elongate, straight, vertical longitudinal axis,

(3) penetrating tool means attached to the lower end of said shaft in an extension of the vertical longitudinal axis thereof,

(4) said penetrating tool comprising a wedge having two broad faces and two narrow faces opposed to themselves on opposite sides thereof,

(5) the lower end of the said shaft beveled on opposite sides thereof in line with the two broad faces of the wedge and in substantial extension and continuation thereof,

(6) an elongate, hollow sleeve of internal shape like that of the transverse cross-sectional shape of the shaft and somewhat less length than said shaft closely fitting over the upper end and substantial length of said shaft and slidably movable thereon,

(7) the upper end of said sleeve closed and adapted to impact on the outer end of said shaft and transmit longitudinal thrust thereinto along the said vertical longitudinal axis thereof into said tool,

(8) the shaft and sleeve being of circular transverse cross-sectional form,

(9) a pair of opposed grasping handles on the outside of said sleeve fixed thereto intermediate the ends thereof, said handles being of closed loop form and substantially 180° opposed to one another, and

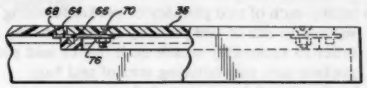
(10) a handle on the lowermost portion of said shaft below the lower extremity of the sleeve when the top of the latter rests on the top of the shaft, the handle on the shaft being of closed loop form and positioned normal to the broader faces of the wedge.

4,350,193

POWER TOOL ACCESSORY TABLE

James McCambridge, Polo, Ill., and Siebolt Hettinga, Adel, Iowa, assignors to Central Quality Industries, Inc., Polo, Ill.

Filed May 1, 1980, Ser. No. 145,423
Int. Cl.³ B25N *1/04;* B27C *9/00*
U.S. Cl. 144—286 R 13 Claims



11. In a power tool accessory table for securing a portable power tool for use as a table mounted tool, the improvement comprising:

a tabletop with an opening therein through which a complete portable power tool may pass;

plate means for supporting said power tool and having an opening in said plate means;

means for securing the power tool to the underside of said plate means whereby the cutting component of the attached power tool projects through the opening in said plate means;

support means carried by the underside of the tabletop and overlapping the lower portion of the opening in the tabletop;

a depending flange around the bottom edge of said plate means having slots on opposite sides thereof, said depending flange resting on said support means from above;

slots in said support means on said tabletop aligning with said slots in said flange on said plate means;

means for securing said plate means and attached tool to said tabletop wherein a surface on said plate means is flush with said tabletop surface; and

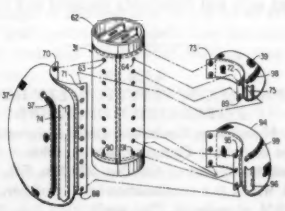
said last named means comprising tabs on said plate means which may be extended into said aligned slots.

4,350,194

UNIVERSAL GOLF BAG

William L. Brown, Sullivan's Island, S.C., assignor to Larry Harold Kline, Charleston, S.C.

Continuation of Ser. No. 88,183, Oct. 25, 1979, Pat. No. 4,282,912. This application Mar. 13, 1981, Ser. No. 243,632
Int. Cl.³ A63B *55/00*
U.S. Cl. 150—1.5 C 20 Claims



1. A bag for transporting golf equipment comprising:

a. a longitudinal structure operative to hold said golf equipment;

b. a plurality of pockets, each removably secured to said longitudinal structure;

c. a fastening area on the outside surface of said longitudinal structure operative for the securing of said plurality of pockets;

d. a mounting area on the outside surface of said longitudinal structure not operative for the securing of said plurality of pockets;

e. a plurality of bag fastening means secured to said fastening area of said longitudinal structure and spaced apart a pre-determined distance or multiples of said pre-determined distance; and

f. a plurality of pocket fastening means spaced apart a pre-determined distance or multiples of said pre-determined distance operative to removably secure said plurality of pockets to said plurality of bag fastening means;

whereby each of said plurality of pocket fastening means is secured to one of said plurality of bag fastening means in order to removably secure each one of said plurality of pockets onto said fastening area of said bag;

whereby if said bag is mounted on any type of cart, said mounting area would face said cart and said fastening area would face away from said cart.

4,350,195

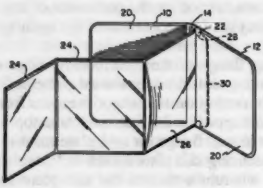
DEVICE FOR STORING DOCUMENTS

Gundar Viesturs, Oak Hill Dr., and Eric A. Viesturs, 680B Heritage Village, both of Southbury, Conn. 06488

Continuation of Ser. No. 25,119, Mar. 29, 1979, abandoned. This application Feb. 19, 1981, Ser. No. 235,925

Int. Cl.³ A45C *1/06*

U.S. Cl. 150—39 **6 Claims**



1. A device comprising:

a flat rectangular first member;

a rectangular strip disposed along and overlying one side of one surface of said member;

a plurality of posts, said posts being disposed between and secured to said strip and said member in spaced apart positions; and

a flexible rectangular sheet having at least one section having essentially the same shape as said member and smaller than said member, said section containing a pocket for storing documents, said section having on one side thereof a flap having a like plurality of notches, each notch being aligned with and detachably engaged to a corresponding post.

4,350,196

NON-PNEUMATIC STRUCTURALLY RESILIENT INTEGRATED WHEEL-TIRE

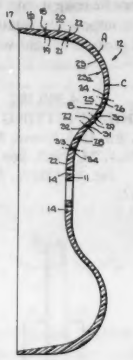
William J. Hampshire, Peninsula, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 879,586, Feb. 21, 1978, abandoned, which is a continuation-in-part of Ser. No. 722,572, Sep. 13, 1976, abandoned. This application Feb. 28, 1980, Ser. No. 125,428

Int. Cl.³ B60B *9/00*

U.S. Cl. 152—5 **52 Claims**

25. A molded resilient fiber reinforced plastic automotive wheel structure comprised of an open rim constituted by a first frustum of a right circular cone, a first toroidal segment having an outer edge attached continuously and tangentially to the smaller diameter edge of said first frustum, a radial mounting disc adapted for attachment at its inner portion to an axle, a second toroidal segment having a smaller diameter inner edge attached continuously and tangentially to the larger diameter outer edge of said disc, a second conical frustum interconnecting said first and second toroidal segments, said wheel structure having an S-shaped cross-sectional configuration and the



ratio of load to deflection above the design load is greater than the ratio of load to deflection below the design load.

4,350,197

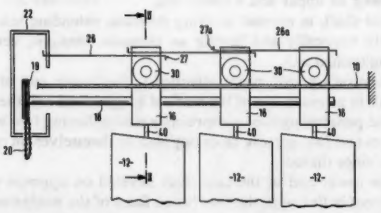
SHUTTER BLIND ASSEMBLY

Berthold Haller, Steinweg 1, 7209 Aldingen, Fed. Rep. of Germany

Filed Aug. 3, 1978, Ser. No. 930,506

Int. Cl.³ E06B *9/26*

U.S. Cl. 160—166 A **9 Claims**



1. A shutter blind comprising:

a supporting rail means;

a plurality of carriages slidably mounted on said supporting rail means;

rotating means within a respective one of said carriages, a respective one of said rotating means comprising a rotatable rod having recesses on its outer surface, a hollow cylinder surrounding said rod, said hollow cylinder being provided with a friction-locking means on its outer surface, a keying means comprising a form-lock mating interconnection between said rotatable rod and said hollow cylinder, a worn gear surrounding said hollow cylinder and interconnected to said hollow cylinder by means of said friction-locking means;

a plurality of sprocket gears, each sprocket gear drivingly interconnected with a respective one of said worm gears;

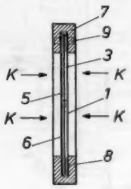
a plurality of supporting rods, each supporting rod interconnected with a respective one of said sprockets;

a plurality of shutters, each shutter being mounted on a respective one of said supporting rods.

4,350,198
ANIMAL GATE, TRAINING MEMBRANES AND METHOD OF TRAINING THE ANIMAL TO USE SUCH GATE

Werner Naegeli, Burgstrasse 50, 8408 Winterthur, Switzerland

Filed Feb. 6, 1981, Ser. No. 232,311
Claims priority, application Switzerland, Feb. 22, 1980, 1412/80
Int. Cl.³ E06B *3/80*
U.S. Cl. 160—179 **34 Claims**



1. An animal gate for the passage of animals and which is arranged in an opening which connects one room or area with another, comprising:

at least two coacting elastic membranes;

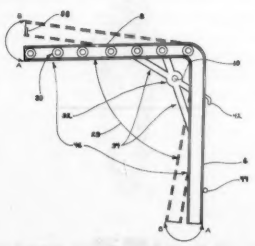
each of said elastic membranes being provided with gap means forming membrane flaps; and

frame means for retaining the membranes at their circumference in such a manner that as a result of assembly of the membranes in the frame means the membranes undergo a change in shape which causes said membranes to be pressed against one another.

4,350,199
QUICK CLOSING GATE

Isidro Pino, Zia Pueblo, San Ysidro, N. Mex. 87053

Filed Feb. 5, 1981, Ser. No. 231,651
Int. Cl.³ E05D *15/12, 15/22*
U.S. Cl. 160—201 **9 Claims**



1. Quick closing gate, comprising:

(a) gate track disposed on each side of said gate, comprising:

(1) lower gate track, disposed in an approximately vertical orientation;

(2) upper gate track, joined to said lower gate track at a curved junction, said upper gate track and lower gate track forming an acute angle reasonably close to 90 degrees;

(3) stop means, located at the end of said upper gate track opposite said junction, for preventing egress from said upper gate track of objects sliding within said upper gate track;

(b) rotation means, connected to said gate track and to fixed supports, for rotating said gate track about a pivot axis perpendicular to the plane of said lower gate track and said upper gate track;

(c) gate track stop means, engaging said gate track to a fixed support, for maintaining said lower gate track in a vertical position;

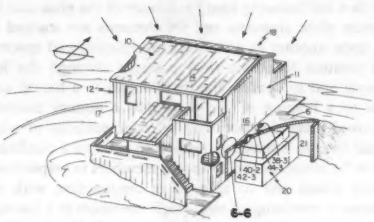
(d) a plurality of horizontal bars slidably engaged in said gate track at the ends of said bars;

(e) spacer means, flexibly attached to said bars, for maintaining uniform spacing between said bars while allowing said bars to freely slide between said upper gate track and said lower gate track.

4,350,200
SOLAR ENERGY COLLECTOR AND SYSTEM

John A. McElwain, Calle Fray Luis DeLeon 4-Entl.°, Palma de Mallorca, Spain

Continuation-in-part of Ser. No. 927,048, Jul. 24, 1978, abandoned. This application Dec. 21, 1979, Ser. No. 105,936
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—48 S **24 Claims**



1. A conditioning system arranged for connection to a collector of solar energy and to space to be heated or cooled, said system comprising:

a cold tank of liquid at a relatively low temperature;

a heat tank of liquid at a relatively high temperature;

a heat pump for transferring heat from said cold tank to said heat tank;

a cold exchanger in said cold tank having an air inlet and an air outlet and operative for transferring heat between air flowing therethrough and liquid in said cold tank;

conduits attached to said cold exchanger and arranged to direct said air flowing therethrough between said cold exchanger and (i) the space to be heated or cooled by said conditioning system and (ii) said collector;

a heat exchanger in the heat tank having an air inlet and an air outlet and operative to transfer heat between liquid in said heat tank and air flowing through said heat exchanger; and,

conduits attached to said heat exchanger and arranged to direct air between said heat exchanger and (i) the space to be heated or cooled by said conditioning system and (ii) said collector,

said heat exchanger being connected in parallel with said cold exchanger.

24. In a conditioning system comprising a tank of liquid for storage of heat and a heat exchanger having inlets and outlets attached to an air source and arranged to transfer heat between said tank of liquid and air from said air source, that improvement comprising;

a first set of ducts providing for flow of air in a closed loop including said source and said heat exchanger;

a second set of ducts providing for flow of air in an open path extending from the atmosphere through said source and said heat exchanger and then discharging to the atmosphere; and

control means for causing air to flow in a selected one of said closed loop and said open path.

4,350,201

SELF FIXTURING HEAT EXCHANGER

Robert J. Steineman, West Carrollton, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Jan. 12, 1981, Ser. No. 224,035
Int. Cl.³ F28F 3/10
U.S. Cl. 165—76 **9 Claims**

1. In a self fixturing heat exchanger of the plate and fin type wherein plate elements and fin elements are stacked loosely one upon another in an alternating relation and spacer members position to define flow passages through the heat exchanger and to confine the fin elements in a lateral sense, all prior to a brazing of the parts into a unitary assembly; an improved plate element marginal edge portions of which are turned over in a selective fashion to achieve a confining relation to fin elements and to spacer members in respective longitudinal senses and to achieve in conjunction with said fin elements a confining of said spacer members in a lateral sense, obviating a need for a special fixture to hold assembled parts for brazing.

4,350,202

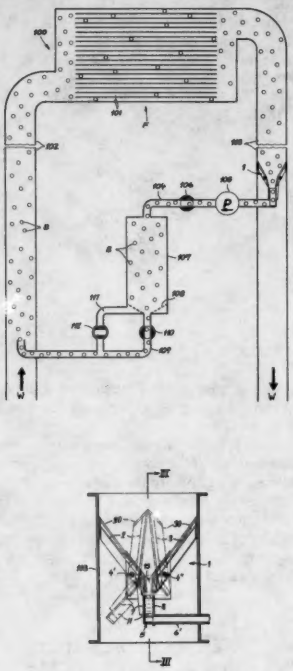
EXTRACTOR FOR RECIRCULATING CLEANING BODIES IN A FLUID-CIRCULATION SYSTEM

Adalbert Schulz, New York, N.Y., and Werner Borchert, Düsseldorf, Fed. Rep. of Germany, assignors to Kleiber & Schulz, Inc., Huntington Station, N.Y.

Filed Aug. 14, 1979, Ser. No. 66,380
Int. Cl.³ F28G 9/00
U.S. Cl. 165—95 **11 Claims**

1. In a fluid-circulation system including an entrance duct, a descending exit duct, a bank of tubes of substantially identical inner diameter smaller than that of said ducts interconnecting the latter, an extractor in said exit duct for intercepting solid cleaning bodies entrained through said tubes by the circulating fluid and returning said bodies to said entrance duct via a bypass connection, and retaining means in said bypass connection operable to halt the recirculation of said bodies through said ducts and tubes during a regeneration phase, said extractor comprising a funnel divided into two generally flat sieves which converge downward in a working position from the inner periphery of said exit duct towards a central duct axis into a downwardly diverging regenerating position,

the improvement wherein said extractor further comprises an upwardly open collecting box below said sieves whose interior opens onto tubular outlet means in a plane transverse to said duct axis communicating with said bypass connection, said box having a solid bottom just below said outlet means and further having broad faces above said bottom formed by two relatively separable sidewalls which are closely spaced from each other and from lower edges of said sieves in said working position, said bottom being integral with and substantially perpendicular to one of said sidewalls and being connected through the latter with the adjoining sieve for separation from the other



sidewall and from said outlet means upon a swinging of said sieves into said regenerating position.

4,350,203

WELL PRODUCTION SYSTEM TO PREVENT CAVE-IN AND SLOUGHING IN UNCONSOLIDATED FORMATIONS

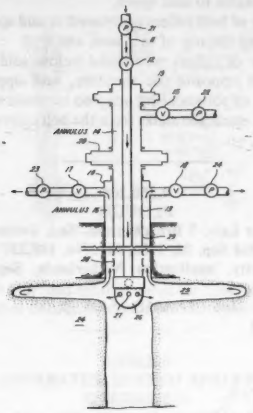
Richard H. Widmyer, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 28, 1980, Ser. No. 210,874
Int. Cl.³ E21B 43/04
U.S. Cl. 166—51 **9 Claims**

9. A well production and sand packing system for producing a well in an unconsolidated formation having an overburden wherein the well has an inner high pressure wash pipe means, an inner annulus formed by a screen around the wash pipe means, and an outer annulus around the screen comprising in combination,

(a) control valve means for each of said wash pipe means and inner and outer annuli for controlling the ingress and egress of fluids and removed formation material from therein for forming a sand pack in the well and simulta-

neously said control valve means comprising means for applying and maintaining a positive fluid pressure against



the cavity walls to prevent cave-in and sloughing of the formation cavity walls until the sand pack is formed.

4,350,204

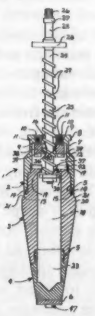
REAMER

Gary B. Horton, 4514 Palmetto Dr., Benton, La. 71006

Filed Jun. 9, 1980, Ser. No. 157,867

Int. Cl.³ E21B *37/02*

U.S. Cl. 166—175 **14 Claims**



1. A reamer for use with a wire line in the loosening of oil well tubing and casing comprising:

(a) a housing having a hollow interior and an opening in the top thereof communicating with said hollow interior;

(b) a shaft extending through said opening and into said hollow interior and provided with external shaft threads turned in the opposite direction from the tubing and casing threads;

(c) stop means on the end of said shaft projecting into said hollow interior to limit the travel of said shaft and coupling means on the outside end of said shaft extending from said hollow interior for attaching said outside end of said shaft to the wire line;

(d) a lock nut disposed in said hollow interior and having at least one lock nut lug on the bottom face thereof, and provided with internal lock nut threads in threadable cooperation with said shaft threads on said shaft; and

(e) at least on lug seat provided in said hollow interior beneath said lock nut for registration with said at least one lock nut lug to effect rotation of said lock nut and said housing on said shaft when a load is applied to said shaft.

4,350,205

WORK OVER METHODS AND APPARATUS

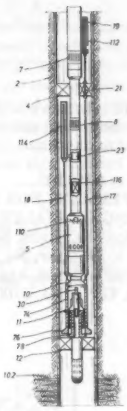
Pierre H. Goldschild, Vulaines-sur-Seine, and Christian C. Robert, Melun, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Mar. 6, 1980, Ser. No. 127,621

Claims priority, application France, Mar. 9, 1979, 79 06053

Int. Cl.³ E21B *23/00*

U.S. Cl. 166—375 **20 Claims**



1. Apparatus for isolating an underground earth formation intersected by a well bore, comprising: packer means having an opening therethrough and adapted to be anchored in a sealed but removable manner in the well bore above said formation; valve means connected to the upper end of said packer means, said valve means including a valve body having a flow passage communicating with said opening and with the well bore above said packer means, and a valve element mounted on said valve body and arranged for movement between positions opening and closing said flow passage; and retrievable hydraulically operable valve actuator means fixed to the lower end of a pipe string extending upwardly to the surface, said actuator means including an actuator sleeve that is adapted to be releasably connected with said valve element for moving said valve element between open and closed positions in response to the pressures of fluids in the well above said packer means.

4,350,206

FIRE EXTINGUISHING FOAM CONCENTRATE AND ITS APPLICATION

Bernd Hoffmann, Frankfurt am Main; Siegfried Jüng, Karben, and Hans-Joachim Semmler, Hochheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 29, 1981, Ser. No. 306,880

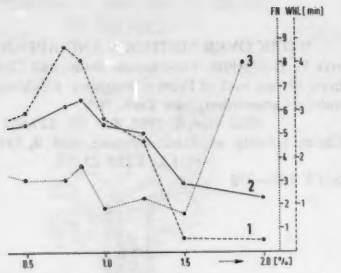
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1980, 3037155

Int. Cl.³ A62B *1/12*

U.S. Cl. 169—47 **5 Claims**

1. In a film-forming fire extinguishing foam concentrate containing water, at least one hydrocarbon surfactant and at least one fluorosurfactant compatible with the hydrocarbon

surfactant; the improvement comprising 0.1 to 4% by weight based on the surfactants of an aliphatic carboxylic acid of the



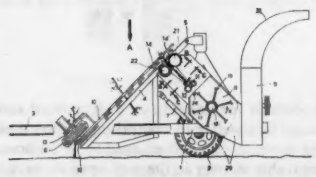
formula $C_nH_{2n+1}COOH$, in which n is an integer of from 7 to 9, or an alkali metal or ammonium salt thereof.

4,350,207

AGRICULTURAL IMPLEMENT FOR THE EXTRACTION AND SHREDDING OF STALKS AND ROOTS

Yaron Ben-Dor, No. 7 Ruth St., Haifa, Israel (34404)

Filed Feb. 6, 1981, Ser. No. 232,355
Claims priority, application Israel, Aug. 28, 1980, 61123
Int. Cl.³ A01D *13/00*
U.S. Cl. 171—58 **8 Claims**



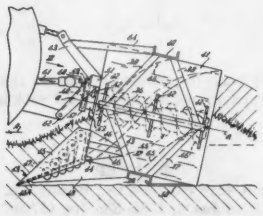
1. A stalk extracting and shredding implement, comprising:
a frame mounted on wheels,
means for attaching the frame to a vehicle,
means for shredding stalks mounted on said frame, said means including a rotary member,
at least two arms pivotally connected to the top of the frame, said arms extending obliquely downward toward the vehicle, said arms defining a space therebetween above the shredding means,
at least two parallel shafts rotatably mounted at the lower ends of each arm,
wheels for extracting stalks from the agricultural land obliquely mounted on said shafts and resilient tires on said wheels having their adjoining surfaces pressed together,
a belt conveyor on the arms adapted to convey the extracted plants from between the extractor wheels,
means for driving said parallel shafts,
a first upper and first lower pulley in spaced relation to one another on the each arm adjacent said space, said first lower pulley being mounted on one of said parallel shafts adjacent said space,
a first continuous belt tensioned between said first upper and lower pulleys,
a second upper and second lower pulley in spaced relation to each other on each arm, said second lower pulley being mounted on the other of said parallel shafts remote from said space, said second upper pulley being substantially coplanar in line with and above said first upper pulley adjacent said space,
a second continuous belt tensioned between said second upper and second lower pulley, said first and second belts having portions moving up said arm biased against one another, whereby said first and second belts convey the extracted stalks to said space,
an upper pair of feed rollers positioned in said space between the shredder and the top of said arm, and
a lower pair of rollers positioned below said upper feed rollers and opposite the shredder, said upper pair and lower pair of rollers being adapted to rotate thereby conveying the extracted stalks from the belt conveyor into the shredder.

4,350,208

PLOUGH

Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Sep. 22, 1980, Ser. No. 189,332
Claims priority, application Netherlands, Sep. 21, 1979, 7907032
Int. Cl.³ A01B *15/08, 79/00*
U.S. Cl. 172—1 **41 Claims**



1. A plow comprising a frame and furrow forming means adjacent the front of the frame, said forming means including cutting members positioned to loosen a wide, continuous furrow strip across the width of said plow during travel, elevating means to the rear of said members and a furrow strip turning device to the rear of said elevating means, said device comprising at least one rotary member that engages the continuous strip and urges the strip from the front of the device to the rear while supporting and inverting said strip, driving means connected to rotate said device and deposit the inverted strip in the furrow being formed, said elevating means being a furrow deforming member, said deforming member comprising two groups of rollers arranged in V-shape.

9. A method of plowing ground, comprising cutting loose a continuous furrow strip, elevating the strip to a rotating worm conveyor that initially engages and depresses the top surface of the strip, turning the strip to invert same while winding and supporting the strip on the conveyor to deform the strip and thereafter continuously depositing the strip with an inverted, shallow U-shaped cross section in the formed furrow.

4,350,209

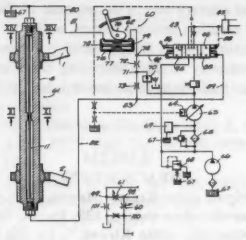
HYDRAULIC DRAFT CONTROL VALVE

John W. O'Connor, Hales Corners, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Division of Ser. No. 64,097, Aug. 6, 1979, Pat. No. 4,293,040.
This application Jun. 5, 1981, Ser. No. 270,993
Int. Cl.³ A01B *63/112*
U.S. Cl. 172—7 **8 Claims**

1. A hydraulic draft load sensing system on a vehicle comprising a source of constant pressure hydraulic fluid, a hydraulic bridge circuit having two flow paths connected to said source of constant pressure hydraulic fluid, each of said flow paths including a variable orifice and a fixed orifice connected by a fluid junction, one of said variable orifices defining a load sensing hydraulic valve, a control valve adapted for controlling fluid flow to a hydraulic actuator, a hydraulic valve operator connected to at least one of said junctions for operating said

control valve responsive to pressure changes in at least one of said junctions, a draft coupling including a three point hitch



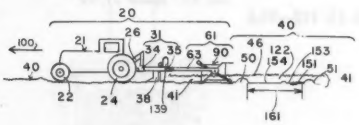
connected to said load sensing valve for controlling the rate of flow responsive to draft loads for operating said control valve.

4,350,210

DIKER, APPARATUS, SYSTEM AND PROCESS OF OPERATION

Oliver W. Shadden, 1501 Avenue L, and Jerry W. Howard, 902 First St., both of Abernathy, Tex. 79311

Filed Oct. 6, 1980, Ser. No. 194,281
Int. Cl.³ A01B *13/16*
U.S. Cl. 172—143 **9 Claims**



1. A diker assembly comprising:

(a) a yoke, said yoke comprising a transverse member and longitudinal arms attached to said transverse member, and

(b) a digging plate and backing plate unit, said digging blade and backing plate unit comprising a first, upper, backing plate portion, a second, lower, backing plate portion and a first, upper, digging plate portion and a second, lower, digging plate portion, a first locator shoe and a second locator shoe, and rigid struts connecting said locator shoes and said digging plate and backing plate unit, said plate portions being flat and rigid, said digging and backing plate unit rotatably connected to said arms of said yoke at the center of said digging plate and backing plate unit,

(c) said first, upper, backing plate portion extending transversely and in a plane forward and downward, said first digging plate extending transversely and in a second flat horizontal plane forming an angle to said first, lower, backing plate portion and said second, upper, backing plate portion extending transversely and in a plane extending rearward and upward and said second digging plate extending transversely and in a third plane and connected to and forming an angle to said second backing plate portion, said first digging plate portion and said second digging plate portion being parallel to each other,

(d) a first strut extending rearwardly and downwardly from said digging plate and backing plate unit and a second strut comprising a rigid beam extending forwardly and upwardly therefrom,

(e) said first locator shoe attached to said first strut at the rear and lower end thereof and extending horizontally and forwardly and leftward and rightward transversely of said strut, and said second locator shoe attached to said second strut at the front and upper end thereof and extending horizontally and rearwardly and transversely leftward and rightward of said second strut, each said strut being thin from side-to-side and wide in the vertical plane,

(i) said first locator shoe having a lower edge extending transversely below the plane of said first digger plate, and

(ii) a surface of said first locator shoe extending upwardly and forwardly from said lower edge of said first locator shoe,

(iii) said second locator shoe having an upper edge extending transversely above an extension of said plane of said second digger plate and,

(iv) a surface of said second locator shoe extending downwardly and rearwardly from said upper edge of said second locator shoe,

(f) said digging plate and backing plate unit and said shoes and struts being symmetrical about the center of said backing plate unit halfway between said digging plate portions, and

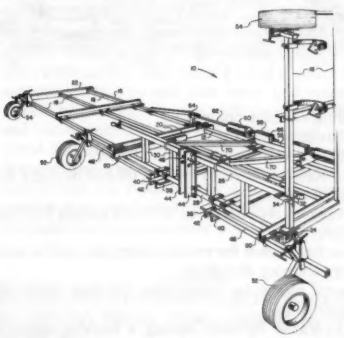
(g) each locator shoe being located in a position determined by the intersection of (i) a first straight line perpendicular to the plane of the backing plate at the center thereof, and (ii) a second straight line perpendicular to the flat plane of a digger plate, and in which position the distance from the tip of said digger plate to the locator shoe forward thereof is greater than the distance from the center of the backing plate to the locator shoe forward of said digger plate.

4,350,211

ADJUSTABLE PATTERN CULTIVATOR

Edward J. Coufal, Rte. 3, Temple, Tex. 76501

Filed Oct. 11, 1979, Ser. No. 83,818
Int. Cl.³ A01B *73/00*
U.S. Cl. 172—311 **8 Claims**



1. An implement for broadcast and row crop cultivation comprising:

first, second and third frames each defined by first and second elongated tubular members spaced apart and extending parallel to each other, and cross bars rigidly interconnecting adjacent ends of said tubular members of each of said frames;

three point hitch means connected to said second frame for connection of said implement to a tractor, said hitch means defining a forward end of said implement and said hitch means being adapted to position the forward edge of said second frame adjacent to and rearwardly of the drive wheels of said tractor;

hinge means connected to adjacent ones of said cross bars of said first and second frames and to adjacent ones of said cross bars of said second and third frames to hingedly connect said first and third frames to said second frame with said tubular members of said frames generally in alignment with each other;

first and second elongated tubular mounts spaced forward of said second frame and having respective first ends rigidly connected to said second frame, said tubular mounts having respective cantilever second ends extending, respec-

tively, in opposite directions generally parallel to said tubular members and laterally with respect to the normal direction of towing of said implement from said second frame beyond said hinge means to points spaced forwardly from said first tubular members of said first and third frames;

first and second gauge wheels slidably carried on said second ends of said first and second tubular mounts and adapted to be selectively positioned on said first and second tubular mounts along said second ends including laterally outboard of said second frame;

third and fourth gauge wheels slidably carried on said first and third frames and positioned at the respective ends of said first and third frames opposite said second frame; and

a plurality of plow shanks carried by said tubular members of said frames and spaced along said tubular members at positions selected according to a preselected mode of cultivation.

4,350,212

STEP FEED DRILLING MACHINE

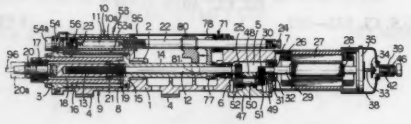
Noboru Hirose, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 23, 1980, Ser. No. 190,068

Claims priority, application Japan, Oct. 3, 1979, 54-127483

Int. Cl.³ E21C *5/10*

U.S. Cl. 173—6 **9 Claims**



1. A drilling machine comprising:

a frame having a liquid tank,

a quill reciprocably mounted in the frame,

a spindle rotatably mounted in the quill and having a tool at one end thereof,

a motor operatively connected with the spindle for rotating the same,

pneumatic feed means for reciprocating the quill in advancing and returning directions,

feed control means for controlling the feed speed of the quill, including;

(a) a hydraulic cylinder having a housing disposed in parallel with the axis of the quill and connected to the liquid tank at one end thereof through a liquid passage, and a piston assembly disposed within the housing and having a portion projecting from the other end of the housing,

(b) means for biasing the piston assembly in the returning direction,

(c) regulating means disposed in the liquid passage for regulating flow of liquid from the hydraulic cylinder to the tank and allowing free-flow of the liquid from the liquid tank to the hydraulic cylinder,

(d) engaging means for engaging the quill with the projecting portion of the piston assembly when the quill arrives at a desired position in the forward movement thereof, whereby the quill is moved at a rapid speed by the pneumatic feed means until it engages with the projecting portion and then is moved at a slow speed controlled by the regulating means,

one-way clutch disposed between the piston and the frame for permitting the movement of the piston assembly only in the advancing direction of the quill,

first operation control means for controlling the pneumatic feed means to make the quill repeat a drilling cycle wherein the quill returns after a drilling operation and advance again for resuming the drilling operation,

position sensing means for generating a sensing signal when the quill has been moved to the forwardmost position,

second operation control means for stopping the operation of the first control means in response to the sensing signal from the position sensing means, and

clutch releasing means for permitting the movement of the piston assembly in the returning direction of the quill when the quill has been moved to the backwardmost position.

4,350,213

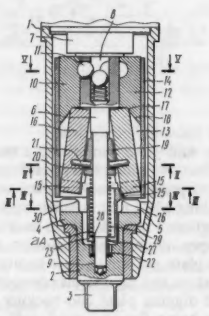
IMPACT WRENCH

Georgy A. Antipov, ulitsa Krasny Mayak, 3, kv. 146; Mikhail L. Gelfand, Yaroslavskoe shosse, 129, kv. 44, both of Moscow; Yakov I. Tsipenjuk, ulitsa Kirova, 6, kv. 30, Solntsevo Moskovskoi oblasti; Boris G. Goldshtein, ulitsa Molodogvardeiskaya, 24, korpus 1, kv. 26, Moscow; Nikolai S. Lavnikov, ulitsa Kustanaiskaya, 117, kv. 10, Rostov-na-Donu; Leonid N. Teres, ulitsa 2 Koltsevaya, 61/21, Rostov-na-Donu; Ivan I. Urazhdin, ulitsa Engelsa, 52/56, kv. 18, Rostov-na-Donu; Petr S. Yakubovsky, Podshipnikovy pereulok, 12, kv. 36, Rostov-na-Donu; Vitaly T. Boiko, ulitsa Jubileinaya, 13a, kv. 24, Ljubertsy Moskovskoi oblasti; Anatoly M. Kalmykov, ulitsa Artjukhinoi, 7/7, kv. 51, Moscow; Dmitry P. Minyashkin, ulitsa Junykh Lenintsev, 43/33, kv. 213, Moscow, and Mikhail M. Stepanov, ulitsa Chistova, 13a, kv. 90, Moscow, all of U.S.S.R.

Filed Oct. 19, 1979, Ser. No. 86,285

Int. Cl.³ B25B *21/02*

U.S. Cl. 173—93.6 **10 Claims**



1. An impact wrench comprising a housing; a drive motor accommodated in said housing and having a drive shaft; a spindle journalled in said housing; an anvil having impact jaws and rotatable together with said spindle; a hammer having a flywheel mass coupled to the drive shaft for combined rotation and impact jaws coupled to the flywheel mass for combined rotation and for relative axial movement during acceleration of the hammer, both said anvil and flywheel mass being fixed against axial movement; flyweights in said hammer for causing said impact jaws of said hammer to move toward said anvil for engagement with said impact jaws of said anvil; means provided between said impact jaws of said hammer and said anvil for preventing said impact jaws of said hammer from engaging said impact jaws of said anvil until said flywheel mass gains a predetermined rotational speed, said means preventing the engagement comprising an axially movable sleeve mounted on said drive shaft in such a manner that it is tiltable in the plane extending through the axis of said drive shaft between a first position in which said tiltable sleeve is in engagement with said impact jaws of said hammer and a second position in which said sleeve is disengaged from said impact jaws of said hammer, said tiltable sleeve being mounted for rotation together with said impact jaws of said hammer, said anvil having means engageable with said tiltable sleeve upon the movement of said

tiltable sleeve toward said anvil together with said impact jaws of said hammer, whereby said sleeve is caused to tilt to said second position; and a spring between said tiltable sleeve and said anvil.

4,350,214

RAM BLOCK

Kjell G. Landaeus, Lund, Sweden, assignor to Lund Hydromaskin AB, Eslov, Sweden

PCT No. PCT/SE79/00178, § 371 Date May 5, 1980, § 102(e) Date May 5, 1980, PCT Pub. No. WO80/00584, PCT Pub. Date Apr. 3, 1980

PCT Filed Sep. 4, 1979, Ser. No. 193,527

Claims priority, application Sweden, Sep. 5, 1978, 7809303

Int. Cl.³ B25D *17/06*

U.S. Cl. 173—126 **4 Claims**

1. A ram block for driving piles and the like into the ground comprising an inner steel cylinder, an outer steel cylinder surrounding the inner steel cylinder coaxially, annular end wall means connecting the inner steel cylinder and the outer steel cylinder at the lower ends thereof, a cap connected to and covering the lower end of the inner steel cylinder, lead enclosed within the inner steel cylinder and lead enclosed in the annular space between the inner steel cylinder and the outer steel cylinder.

4,350,215

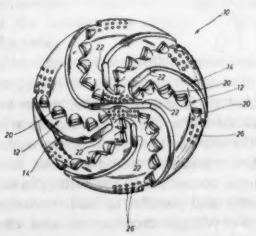
DRILL BIT AND METHOD OF MANUFACTURE

Robert P. Radtke, Kingwood, Tex., assignor to NL Industries Inc., New York, N.Y.

Continuation of Ser. No. 943,313, Sep. 18, 1978, abandoned. This application Sep. 22, 1980, Ser. No. 189,370

Int. Cl.³ E21B *10/58*

U.S. Cl. 175—329 **19 Claims**



1. A method of manufacturing a drill bit for use in association with a rotary drill stem, said bit comprising a bit head having a plurality of dimensionally controlled pockets and a plurality of cutter assemblies secured within said pockets which cutter assemblies comprise cutter face material that suffers thermal damage above a thermal degradation temperature; said method comprising the steps of:

forming a drill bit head by powder metallurgy at a temperature above the cutter face material thermal degradation temperature, with said plurality of dimensionally controlled pockets each having sidewalls and being free from internal negative relief and formed to present the cutter face of each said cutter assemblies at a predetermined rake angle;

forming said cutter assemblies, each comprising a drill blank having a cutter face and a support secured to said drill blank, wherein said support is of a material and has dimensions such that said support forms a frictional relationship with the sidewalls of a pocket without deforming said bit head when said support is force fit into said pocket and subsequently heated to a brazing temperature below the degradation temperature of said cutter face;

placing a brazing material in communication with each of said pockets;

force fitting said cutter assembly supports into said dimensionally controlled pockets; and

brazing said cutter assembly supports within said pockets by a furnace cycle having a maximum temperature below said cutter face thermal degradation temperature.

11. A drill bit comprising:

A drill bit head formed by powder metallurgy and having a plurality of dimensionally controlled pockets formed therein, which pockets have sidewalls free from internal negative relief; and

a plurality of cutter assemblies, one for each of said pockets, each comprising a drill blank having a cutter face, and a support secured to said drill blank and secured to said pocket by brazing, wherein each support is of a material and has dimensions such that said support forms a frictional relationship with the sidewalls of a pocket without deforming said bit head when said support is force fit into said pocket and subsequently said cutter assemblies and said bit head are heated to a brazing temperature below the degradation temperature of said cutter face.

4,350,216

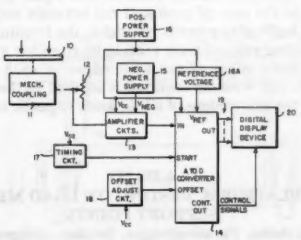
WEIGHING DEVICES USING ELECTRONIC CIRCUITRY

Anton Mavretic, Natick, Mass., assignor to Avitar, Inc., Rumford, R.I.

Filed Sep. 11, 1980, Ser. No. 186,315

Int. Cl.³ G01G *23/14, 3/14*

U.S. Cl. 177—164 **11 Claims**



1. A weighing device comprising

movable platform means for accepting a weight placed thereon;

means for providing an analog voltage;

means for mechanically coupling said movable platform means and said analog voltage providing means to pro-

duce an analog voltage therefrom which is proportional to the displacement of said platform means;

electric circuit means responsive to said analog voltage for providing a corresponding digital voltage representation thereof, said circuit means including

means for amplifying said analog voltage to produce an amplified analog voltage;

analog-to-digital converter means responsive to said amplified analog voltage to produce said digital voltage;

first power supply means for providing a fixed positive reference voltage for said amplifying means;

second power supply means for providing a fixed negative reference voltage for said amplifying means;

first variable adjusting means for adjusting the digital voltage output from said analog-to-digital converter means to zero when no weight has been placed on said movable platform means.

4,350,217

BALANCE ARM FOR FLAT WEIGHING MACHINES

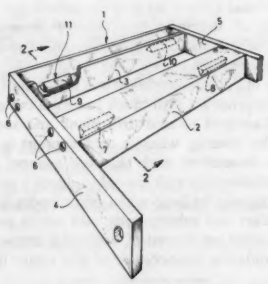
Ernst Kuhnle, and Josef Schwarz, both of Balingen, Fed. Rep. of Germany, assignors to Bizerba-Werke Wilhelm Kraut KG, Balingen, Fed. Rep. of Germany

Filed Oct. 29, 1980, Ser. No. 201,812

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1979, 2944126

Int. Cl.³ G01G *21/14, 21/04*

U.S. Cl. 177—246 **4 Claims**



1. Balance arm for flat weighing machines comprising two spaced side beams, at least two girder section rails each having a U-shaped cross-section along its entire length and open ends, said U-shaped cross-section comprising a base and two spaced sides extending at right angles with respect to said base, the open ends of said rails being secured to said side beams by screw means to form a rigid frame, in which said rails are arranged in spaced parallel relation, and a pair of knife-edges attached to the base of each said rail between said sides such that each knife-edge extends parallel to the longitudinal axis of the respective rail, wherein each knife-edge has a sharp edge and the sharp edges of the knife-edges of each pair are in alignment, and wherein each rail is secured to the side beams such that the sharp edges of all the knife edges lie in a common plane.

4,350,218

WEIGH-PLATFORM, RESTING ON LOAD MEASURING SUPPORT POINTS

Arne Söderholm, Furusangsvägen, Sweden, assignor to S.E.G. Resistor A.B., Vallingby, Sweden

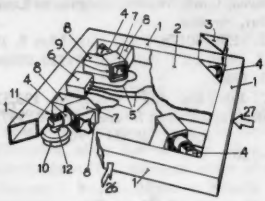
Filed Nov. 7, 1980, Ser. No. 204,906

Claims priority, application Sweden, Nov. 21, 1979, 7909626

Int. Cl.³ G01G *21/23*

U.S. Cl. 177—255 **4 Claims**

1. Electromechanical load-measuring apparatus comprising a substantially horizontal platform for receiving a load to be measured; a plurality of load-measuring means each in the form of a substantially horizontal beam which includes a load sensing cell for transducing part of the platform load to an electric signal, and means for transmitting the platform load to said load-measuring beams, said means including first connecting means connecting one end of each load-measuring beam to the platform, said first connecting means being rigid in the vertical



direction and elastically resilient in horizontal directions, at least in the direction perpendicular to the longitudinal axis of the beam and second connecting means for connecting the opposite end of each beam to a foundation in a manner such that the connection is elastically resilient in the vertical plane and in horizontal planes and elastically yielding to angular deflections to moments about axes in these planes.

4,350,219

BATTERY POWERED ELECTRIC MOTOR VEHICLE

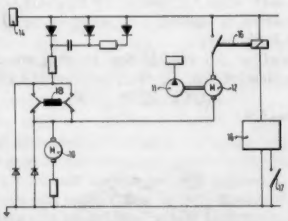
Gottfried Olbrich, Sachsenheim, and Peter Pfeffer, Lauffen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 5, 1980, Ser. No. 213,543

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1979, 2950670

Int. Cl.³ B62D *5/04*

U.S. Cl. 180—65 R **5 Claims**



1. A storage battery powered, electric motor vehicle, particularly an electric fork lifter, having a main electric drive motor connected to the storage battery in series with an electrical control circuit, comprising a steering device having an auxiliary electric motor connected to the battery in series with said main drive motor and parallel to said control circuit to be energized by the voltage drop across said control circuit, wherein the sun of the instantaneous voltage applied to the drive motor and the voltage drop across said control circuit is equal to the voltage from the storage battery.

4,350,220
AUTOMOTIVE DRIVE SYSTEM

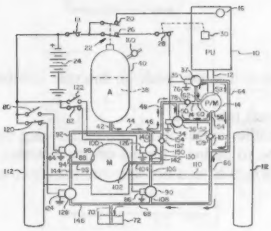
Vincent E. Carman, Portland, Oreg., assignor to Advanced Energy Systems Inc., Portland, Oreg.

Continuation of Ser. No. 948,827, Oct. 5, 1978, Pat. No. 4,227,587, which is a continuation of Ser. No. 765,951, Feb. 7, 1977, abandoned. This application Jul. 10, 1980, Ser. No. 167,446

The portion of the term of this patent subsequent to Oct. 14, 1997, has been disclaimed.

Int. Cl.³ B60K *9/00*

U.S. Cl. 180—165 3 Claims



1. In a wheeled vehicle having an engine and a system for selectively storing energy normally lost in braking the vehicle and using said energy to drive the vehicle, a drive transmission and engine-starting system comprising:

(a) a mechanical energy storage accumulator for collecting and storing mechanical energy;

(b) a power transmission mechanically coupled to at least one wheel of said vehicle for driving and being driven by said wheel;

(c) a transmission controller selectively mechanically connecting said power transmission to said energy storage accumulator for causing said power transmission to deliver mechanical energy to said storage accumulator for storage therein in response to the driving of said power transmission by said wheel to brake said vehicle;

(d) a transmission controller selectively mechanically connecting said power transmission to said energy storage accumulator for causing said power transmission to receive mechanical energy from said storage accumulator to drive said wheel;

(e) said engine being mechanically coupled to said energy storage accumulator for delivering mechanical energy from said engine to said storage accumulator for storage therein;

(f) an energy sensor connected to said energy storage accumulator for sensing the amount of mechanical energy stored therein;

(g) an engine stop-start controller connected responsively to said energy sensor and connected to said engine for stopping said engine when the amount of energy in said energy storage accumulator exceeds a predetermined maximum and for starting said engine in response to a drop in the energy in said storage accumulator below a predetermined minimum; and

(h) means automatically responsive to the starting of said engine for selectively preventing the delivery of mechanical energy from said engine to said storage accumulator during said starting of said engine and permitting said delivery after said starting of said engine.

4,350,221
SNOWMOBILE FRAME WITH CORNER-MOUNTED DAMPERS

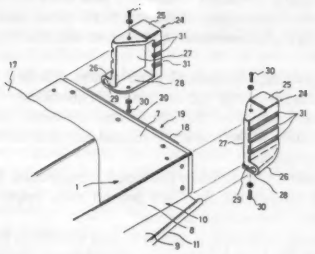
Takaharu Ishima, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 18, 1980, Ser. No. 160,469

Claims priority, application Japan, Jun. 30, 1979, 54/83141

Int. Cl.³ B60N *3/00;* B60R *19/08*

U.S. Cl. 180—190 6 Claims



1. In a frame for the chassis of a small snowmobile, comprising an upper plate having a pair of opposite side edges, said side edges being pressed downwardly to form respective side plates, and pressed laterally to form respective foot plates at and integrally with the lower edge of the respective side plates, said side plates and foot plates extending along said side edges and terminating at the rear end thereof to form a corner, each said foot plate being substantially flat and horizontal for a substantial area adjacent to said plate at said rear end, the improvement comprising: a damper member made of elastic material disposed at each side of said frame, each said damper being fitted over and covering the top and bottom of at least the rear end portion of said foot plate, extending upwardly along said side plate, and atop said upper plate; and attachment means attaching said damper to said upper plate inwardly of said side plates whereby said damper provides structural support for said rear end of said foot plate to resist downward bending.

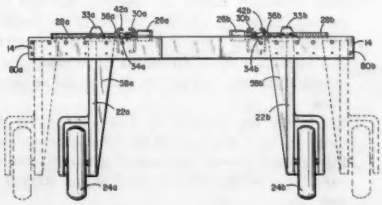
4,350,222
VARIABLE TREAD VEHICLE

Martin T. Lutteke, and Gordon M. Lutteke, both of Rte. 1, Wells, Minn. 56097

Filed Mar. 24, 1980, Ser. No. 133,466

Int. Cl.³ B62D *61/00*

U.S. Cl. 180—209 11 Claims



1. A variable tread vehicle comprising:

a frame;

first and second parallel horizontal rails connected to the frame and extending transverse to a direction of movement of the vehicle to define a track; wherein the first and second rails comprise hollow tubes having generally rectangular cross-sections;

first movable carriage means movable on a first section of the track; the first movable carriage means comprising: first and second slides of C-shaped cross-section for partially surrounding the first and second rails, respectively, for slidable movement thereon;

first brace means attached to and extending between the first and second slides, the first brace means having a substantially vertical portion;

first internally threaded means carried by the substantially vertical portion of the first brace means wherein the first internally threaded means is a first shaft nut attached to the vertical portion of the first brace means and an edge of the first plate means is in abutment with the first shaft nut; and

first generally horizontal plate means attached to and extending between the first and second slides;

second movable carriage means movable on a second section of the track; the second movable carriage means comprising:

third and fourth slides of C-shaped cross-section for partially surrounding the first and second rails, respectively, for slidable movement thereon;

second brace means attached to and extending between the third and fourth slides, the second brace means having a substantially vertical portion;

second internally threaded means carried by the substantially vertical portion of the second brace means wherein the second internally threaded means is a second shaft nut attached to the vertical portion of the second brace means and an edge of the second plate means is in abutment with the second shaft nut; and

second generally horizontal plate means attached to and extending between the third and fourth slides;

first drop axle means attached to the first and second slides and the first plate means of the first movable carriage means proximate its upper end and extending downward;

first gusset means attached to and extending between the first drop axle means and the first plate means;

second drop axle means attached to the third and fourth slides and the second plate means of the second movable carriage means proximate its upper end and extending downward;

second gusset means attached to and extending between the second drop axle means and the second plate means;

a first wheel connected to the first drop axle means proximate its lower end;

a second wheel connected to the second drop axle means proximate its lower end; first internally threaded means for driving the first movable carriage means on the first section of the track;

a first threaded drive shaft extending through the internally threaded means for driving the first movable carriage means on the first section of the track;

a second threaded drive shaft extending through the second internally threaded means for driving the second movable carriage means on the second section of the track;

motor means for rotating the first and second shafts to move the first and second movable carriage means on the first and second sections of the track, and thereby vary the spacing between the first and second wheels; and

first and second arch braces attached to and extending between the first and second rails at positions along the first and second sections of the track for maintaining the first and second rails in fixed relationship with respect to one another while permitting movement of the first and second carriage means on the first and second sections of track, respectively, without interference from the first and second arch braces.

4,350,223

SILENCER

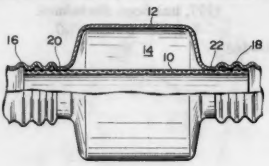
Hirofumi Takei, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 5, 1981, Ser. No. 222,392

Claims priority, application Japan, Jan. 16, 1980, 55-3687[U]

Int. Cl.³ F02M *35/12;* F01N *1/02*

U.S. Cl. 181—229 **7 Claims**



1. A silencer for use with an internal combustion engine comprising:

a foam metal tube; and

a non-metallic, vibration absorbing housing disposed about said tube to define a closed empty chamber between the inner surface of said housing and the outer surface of said tube.

4,350,224

RESCUE SYSTEM ON HIGH RISE BUILDINGS FOR EVACUATING PERSONS IN THE CASE OF FIRE

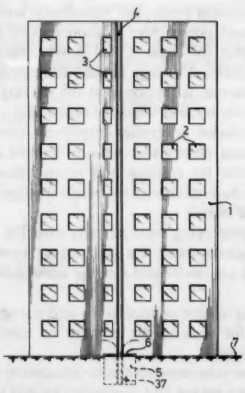
Friedrich Jochum, Kaiserslautern; Ernst Landsberg, Bergisch-Gladbach, and Plano Zschernack, Odenthal, all of Fed. Rep. of Germany, assignors to Walther & Cie Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Jun. 4, 1980, Ser. No. 156,635

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1979, 2922859

Int. Cl.³ A62B *1/02;* B66B *9/02*

U.S. Cl. 182—82 **13 Claims**



1. A rescue system for evacuating persons from a multi-floor structure such as a high-rise building and the like, having a wall provided with at least one rescue window on each floor, comprising an upright climb rail secured to said wall in the range of said windows; a rescue cabin having transmission and guide elements for engaging said rail a driving motor attached to said transmission elements to drive said cabin upwardly and downwardly along said rail, and cabin walls provided with at least one entrance opening facing the rescue windows on respective floors; said upright climb rail being slidably connected to said

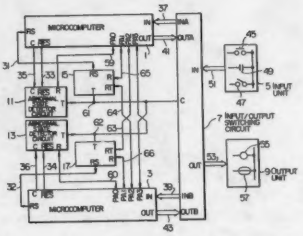
wall of the building to compensate for longitudinal extensions, and being assembled of a profiled inner rail section and two outer rail sections rigidly connected to said inner rail section and forming therewith two lateral cooling chambers.

4,350,225

ELEVATOR CONTROL SYSTEM

Kazuhiro Sakata; Takeo Yuminaka; Masao Nakazato; Kenji Yoneda, all of Katsuta; Soshiro Kuzunuki, and Yasunori Katayama, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 31, 1980, Ser. No. 117,088
Claims priority, application Japan, Feb. 2, 1979, 54/10431
Int. Cl.³ B66B *5/02*
U.S. Cl. 187—29 R **20 Claims**



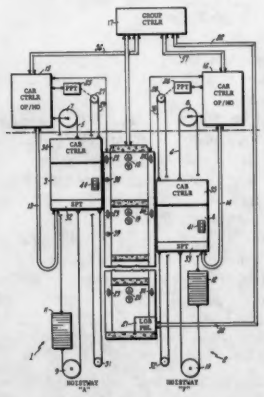
1. An elevator control system comprising an elevator servicing a plurality of floors in a building, and a control logic for the elevator including digital computers, wherein the control logic comprises a plurality of computers, and at least one computer is provided with means for retrial initializing the other computers.

4,350,226

ELEVATOR FLOOR STOP LOOK-AHEAD

George E. Sheehy, Middletown, and Joseph Bittar, Simsbury, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed May 27, 1981, Ser. No. 267,281
Int. Cl.³ B66B *1/18*
U.S. Cl. 187—29 R **2 Claims**



1. An elevator system having a plurality of elevators, each having a car movable in a respective shaftway between a plurality of floor landings in a building, for servicing said landings in common, comprising:

a plurality of selectively actuable request means, each corresponding to one of said landings, a first group thereof each actuable to provide an up hall call signal indicative of a request for service in the up direction from the related landing and a second group thereof each actuable to provide a down hall call signal indicative of a request for service in the down direction from the related landing;

each of said elevators including motion means for selectively providing motion of the respective car in its shaftway in response to a go signal provided thereto and for providing a position signal indicative of the location of said car in said shaftway;

each of said elevators including car control means responsive to said position signal for providing a committable floor signal indicative of the next one of said landings at which said car could be stopped or is stopped and for providing said go signal to said motion means in response to a further demand signal provided thereto; and

group control means for exchanging signals with each of said car control means and responsive to said up hall call signals and said down hall call signals for allocating related requests for service to selected ones of said elevators and providing assigned up call signals and assigned down call signals indicative thereof, and responsive to said committable floor signal provided thereto by each of said elevators and ones of said assigned up call signals and assigned down call signals related to such elevator for providing to the corresponding car control means a further demand signal in each case in which there is an assigned up or down hall call ahead of the committable floor of the related car;

characterized by:

said group control means providing, to each of said car control means, a next committable floor signal indicative of the next floor beyond the floor indicated by the corresponding committable floor signal and for providing to the corresponding car control means a next further demand signal in each case in which there is an assigned up or down hall call ahead of the next committable floor of the car; and

each of said car control means being responsive to the committable floor signal provided thereby and the related next committable floor signal provided thereto by said group control means to provide said go signal to the related one of said motion means in response to said further demand signal only in each case in which said committable floor signal is different from said next committable floor signal and in response to the corresponding next further demand signal in each case in which said committable floor signal is identical to said next committable floor signal.

4,350,227

WHEELCHAIR BRAKE ASSEMBLY

Raymond E. Knoche, Creve Coeur, Mo., assignor to Bohn & Dawson, St. Louis, Mo.

Filed Aug. 25, 1980, Ser. No. 181,179
Int. Cl.³ B60T *1/04*
U.S. Cl. 188—2 F **7 Claims**

1. A brake assembly for a wheelchair having opposed side frames, each side frame carrying a drive wheel and having an upper longitudinal member, the brake assembly being selectively positionable in on and off positions, and comprising:

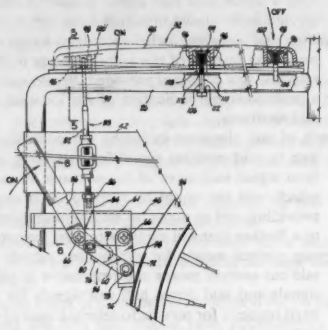
(a) a first link member operatively pivotally mounted to one of the side frames,

(b) a second link member operatively pivotally mounted to said side frame and including a brake shoe engageable with the wheel,

(c) a third link member operatively pivotally interconnecting said first and second link members,

(d) an arm rest having front and rear ends and including means pivotally mounting said arm rest to said side frame upper member, for upward and downward movement of said arm rest front end, and

(e) link means connecting said arm rest to one of said link members, whereby downward movement of the front end of the arm rest moves the brake shoe into engagement with said wheel, the link means including an upper end



connected to the arm rest and a lower end connected to the link members said brake assembly being actuated by said arm rest and associated linkage into an on position but not into an off position.

4,350,228

MECHANICAL ACTUATING DEVICE FOR A SPOT-TYPE DISC BRAKE

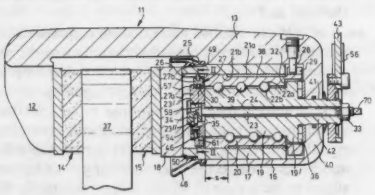
Hans-Henning Luepertz, Darmstadt, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,135

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1979, 2946852

Int. Cl.³ F16D *65/56*

U.S. Cl. 188—71.9 **27 Claims**



1. A mechanical actuating device for a spot-type disc brake comprising:

a brake caliper embracing the periphery of a brake disc, one leg of said caliper having a cylindrical bore therein, said bore having a longitudinal axis parallel to an axis of rotation of said brake disc;

a hollow cylindrical brake piston disposed in said cylindrical bore coaxial of said longitudinal axis, said brake piston being rotatable in said cylindrical bore, acting upon one brake shoe of said disc brake, and having a first thread disposed on the inner surface thereof;

an actuating nut secured against rotation disposed within said brake piston coaxial of said longitudinal axis, said actuating nut having a second thread on at least a portion of its outer surface engaging said first thread;

an actuating spindle disposed within said actuating nut coaxial of said longitudinal axis, said actuating spindle cooperating with said actuating nut to advance said brake piston toward said brake disc upon a relative axial displacement between said actuating spindle and said actuating nut caused by said actuating spindle being rotated by an actuating means coupled thereto; and

an automatic brake pad clearance adjusting device disposed in said brake piston coaxial of said longitudinal axis including

a one-way clutch disposed to act between said brake piston and said actuating spindle to enable maintaining a nominal brake pad clearance with respect to said brake disc by moving said brake piston out of said cylindrical bore when said actuating spindle is returning to its rest position after a brake actuation, said one-way clutch being connected to said actuating spindle during brake operation with this connection being capable of being removed to enable said one-way clutch to rotate independently of said actuating spindle.

4,350,229

DISC BRAKE HAVING A SLIDABLY SUPPORTED CALIPER

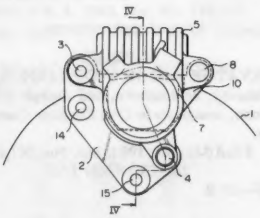
Hiroshi Ito, and Kazuo Saito, both of Kawasaki, Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed Oct. 15, 1980, Ser. No. 197,327

Claims priority, application Japan, Oct. 20, 1979, 54-145233[U]

Int. Cl.³ F16D *65/00*

U.S. Cl. 188—73.45 **8 Claims**



1. A disc brake comprising:

a rotatable disc having an axis of rotation; a holder provided on one side of said disc and securable to a non-rotatable part of a vehicle;

a first pin secured to said holder and extending in the direction of said axis, said first pin being located outside the outer circumference of said disc;

a second pin secured to said holder and extending parallel said first pin and being located radially inwards of the outer circumference of said disc;

a first friction pad disposed on one side of said disc;

a second friction pad disposed on the other side of said disc, each of said first and second pads having first and second ends spaced circumferentially along the circumference of said disc;

a caliper slidably supported on said holder by said first and second pins; and

a third pin mounted on said caliper and parallel with said first and second pins, said third pin being located outside of the outer circumference of the disc, said first ends of said first and second friction pads each being slidably supported on said third pin, and said second ends of at least one of said first and second friction pads being slidably supported on said first pin.

4,350,230

DRUM BRAKES FOR VEHICLES

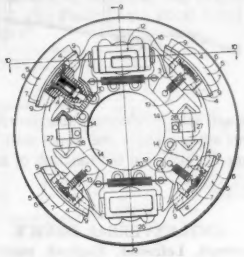
Brian Ingram, Balsall Common; David A. Harries, Solihull, both of England, and Ramamurthy Natarajan, Madras, India, assignors to Girling Limited, Birmingham, England

Continuation of Ser. No. 14,261, Feb. 22, 1979, abandoned. This application Sep. 4, 1980, Ser. No. 184,139

Claims priority, application United Kingdom, Feb. 22, 1978, 6974/78

Int. Cl.³ F16D *51/12*

U.S. Cl. 188—79 **2 Claims**



1. A drum brake for a vehicle comprising a drag-taking member, four separate friction pad assemblies mounted on said drag-taking member for engagement with a rotatable drum, radially arranged drag-taking abutments on said drag-taking member, guide surfaces on said pad assemblies for cooperation with said drag-taking abutments, said drag-taking abutments and said guide surfaces being so constructed and arranged that said pad assemblies are guided for movement substantially in a radial direction towards and away from the drum and all other movements of said pad assemblies with respect to said drum are precluded, two pairs of levers for applying said pad assemblies to said drum, each of said levers acting on a respective one of said pad assemblies, each lever having an inner end and an outer end, struts being provided between said inner ends of corresponding levers of each said pair to provide articulated connections therebetween, a fixed abutment provided on said drag-taking member for engagement by said outer ends of said levers of one pair, and equalising actuating means acting on said levers to equalise the radial components of the brake applying forces applied to said pad assemblies, said actuating means acting on said outer ends of said levers of the other of said pairs to separate the same.

4,350,231

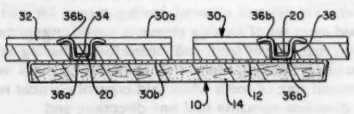
FRICTION WEAR PAD AND METHOD AND MEANS FOR FASTENING SAID PAD TO A DISK CORE MEMBER

Richard L. Crossman, Tallmadge, and Richard L. Kirk, North Canton, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Division of Ser. No. 44,879, Jun. 4, 1979, Pat. No. 4,279,333. This application Sep. 15, 1980, Ser. No. 187,309

Int. Cl.³ F16D *65/12, 69/04*

U.S. Cl. 188—218 XL **4 Claims**



1. A friction component comprising: a substantially circular disk core member having an inner arcuate peripheral edge and an outer arcuate peripheral edge and at least two annular grooves formed in one face surface of the disk core member, a plurality of apertures through the disk core member in alignment with and about the annular grooves, one of said grooves in spaced position from the inner peripheral edge while the other of said grooves is in spaced position from the outer peripheral edge of the disk core member;

a plurality of friction pads mounted on the other face surface of the disk core member opposite said one face surface having the annular grooves, each said pad having a substantially flat base and each said base having a plurality of tabs formed from the base and extending therefrom, said tabs being bent such that a major portion of the length thereof is substantially parallel to the plane of the base and facing toward said other face surface of said disk core member; and

clip means mounted between each of the tabs and the base and penetrating the apertures in the disk core member to said one face surface thereof to an extent such that a portion of their length may be turned down within the grooves and thus securely fasten the friction pads to the disk core member.

4. A method of mounting friction wear pads to but one face surface of a substantially circular disk core member having inner and outer peripheral edges comprising the steps of:

providing at least two annular grooves within one face surface of the disk core member and a plurality of apertures extending through the disk core member in alignment with and about the annular grooves, one of said grooves being in spaced position from the inner peripheral edge while the other of said grooves being in spaced position from the outer peripheral edge;

providing each of said friction wear pads with a base and having a plurality of tabs extending therefrom, at least one tab formed for alignment with one of said apertures in alignment with said one groove and extending toward said outer peripheral edge and at least one tab formed for alignment with one of said apertures in alignment with said other groove and extending toward said inner peripheral edge;

fastening the pads to the other face surface of the disk core member opposite said one surface by attaching U-shaped clips between the tabs and base and driving the clips through the apertures extending through the disk core member; and

bending the ends of said U-shaped clips that extend through to said one face surface of the disk core member down into the annular grooves provided in said one face surface of the disk core member.

4,350,232

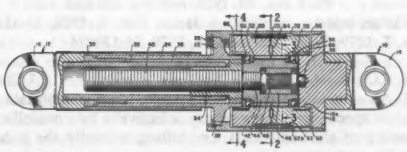
MECHANICAL SHOCK ARRESTOR

Elmer C. Yang, Orange, Calif., assignor to Pacific Scientific Company, Anaheim, Calif.

Filed Mar. 10, 1977, Ser. No. 776,397

Int. Cl.³ F16F *7/10*

U.S. Cl. 188—378 **23 Claims**



1. A motion snubbing device comprising:

a pair of members mounted for relative movement;

a pair of inertia elements mounted to be freely rotated;

means connecting said members to said elements so that relative movement of said members in one direction will drive one of said inertia elements, and relative movement of said members in an opposite direction will drive the other inertia element; and

means connecting said inertia elements in a manner such that rotating either of the elements below a predetermined motion threshold causes such element to rotate the other inertia element, and attempting to rotate said other inertia element above said threshold initiates braking action on said elements and said members which limits motion to said threshold.

4,350,233

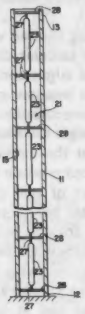
STRUCTURAL DAMPER FOR ELIMINATING WIND INDUCED VIBRATIONS

William H. Buckley, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 1, 1980, Ser. No. 192,671

Int. Cl.³ F16F *7/10*

U.S. Cl. 188—378 **11 Claims**



1. A damping assembly for suppressing fluid flow induced vibrations in an elongated tubular structure which comprises:

a plurality of vibration damping tubes of different predetermined primary resonant frequencies suspended within the structure wherein each damping tube includes an elongated tubular shell having opposite end portions, plug elements secured to said opposite end portions, and an energy damping material disposed within said tubular shell and confined therein by said plug elements; and

means pivotally connecting the spaced end portions of adjacent damping tubes in end-to-end relationship so that said end portions of said damping tubes abut the inner surface of the structure.

4,350,234

AUTOMATIC TRANSMISSION SYSTEM PROVIDED WITH A FUNCTION OF ENGINE BRAKE

Masaaki Suga, Yokohama, and Hideo Hamada, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 30, 1980, Ser. No. 116,849

Claims priority, application Japan, Feb. 2, 1979, 54-11132; Sep. 7, 1979, 54-114075; Sep. 21, 1979, 54-120874

Int. Cl.³ B60K *41/20*

U.S. Cl. 192—4 A **7 Claims**

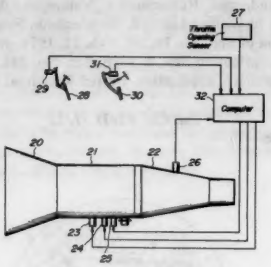
1. An automatic transmission system, wherein a plurality of vehicle speed ranges are set up selectively by controlling a plurality of shift solenoids for shifting mutually the vehicle speed ranges, comprising:

an idling detection means for detecting the release of an accelerator pedal,

a brake action detecting means for detecting the stepping of a brake pedal,

an acceleration discriminating means for detecting the acceleration which exceeds a predetermined amount thereof, and

a control means for controlling said plurality of shift solenoids only when detection output signals are derived from all of said idling detection means, said brake action detecting means and said acceleration discriminating means, so as to effect automatically the down shift of the vehicle speed range for attaining the function of engine braking.



4,350,235

ANTI-REVERSAL DEVICE

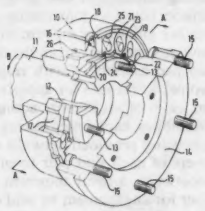
Robert L. Brownett, Leicester, England, assignor to Dunlop Limited, London, England

Filed Jan. 15, 1980, Ser. No. 112,219

Claims priority, application United Kingdom, Jan. 27, 1979, 7902969

Int. Cl.³ F16D *15/00, 41/06*

U.S. Cl. 192—45 **15 Claims**



1. A device for preventing rotation in one direction of a rotating element comprising:

a rotary member having teeth connected to rotate with said element;

a stationary member relatively stationary with respect to said rotary member adjacent said rotary member having first and second concentric sets of teeth radially directed toward said rotary member teeth;

a main set of locking elements disposed between teeth along said rotary member, said locking elements being displaceable in a direction for engaging said first set of teeth and said rotary member teeth;

an auxiliary set of locking elements displaceable into and out of engagement with said second ring of teeth;

a control element rotatable with respect to said rotary member, said control element having means for maintaining said main set of locking elements out of engagement with said first ring of teeth and means for displacing said set of auxiliary locking elements out of engagement with said second ring of teeth when said control element rotates in a direction opposite said one direction; and

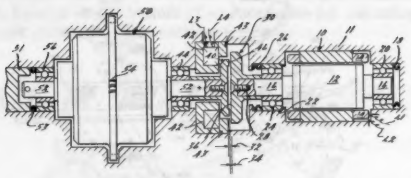
means for displacing said auxiliary set of locking elements into engagement with said second ring of teeth and said control element when said control element rotates in said one direction, and means for displacing said main set of locking elements into communication with said stationary member first set of teeth in response to engagement of said

auxiliary locking elements due to rotation of said control element in said one direction whereby any initial rotation of said control member in said one direction results in engagement of said rotary member, control member, stationary member, and sets of locking elements stopping rotation of said rotary member.

4,350,236
ELECTROMAGNETIC CLUTCH ASSEMBLY

Paul H. Stahlhuth, Mission Viejo, Calif., assignor to Ford Aerospace & Communications Corp., Detroit, Mich.

Filed Dec. 8, 1980, Ser. No. 214,363
Int. Cl.³ F16D *27/10*; F02C *7/268*
U.S. Cl. 192—84 C **6 Claims**



1. An electromagnetic clutch assembly for controlling the engagement and disengagement of a rotatable prime mover with a rotatable load wherein said assembly includes:

a clutch rotor having a frictional engagement surface attached to said load and mounted for axial rotation about a first axis;

a clutch armature having a frictional engagement surface opposed to said clutch rotor engagement surface rigidly attached to said prime mover and mounted for axial rotation about said first axis;

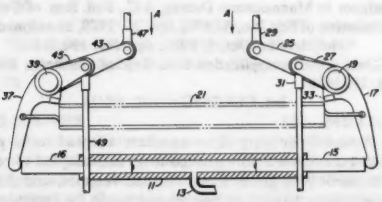
electromagnetic means mounted adjacent said clutch rotor and clutch armature to cause engagement of said clutch rotor and clutch armature engagement surfaces and thereby communicate rotational driving forces from said prime mover to said load through said frictional engagement surfaces when energized by an external electrical source; and

means for mounting said clutch armature and prime mover to move axially as a single unit.

4,350,237
FAIL-SAFE BRAKE LINKAGE

David L. Coleman, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jul. 18, 1980, Ser. No. 170,264
Int. Cl.³ B60T *7/12*; F16D *65/14*
U.S. Cl. 192—116.5 **2 Claims**



1. A fail-safe brake linkage for a vehicle comprising:

a. hydraulic cylinder having a cylinder rod exdendable therefrom upon the introduction of pressure influenced hydraulic fluid therein, said cylinder rod to be retractable should the hydraulic cylinder pressure be reduced;

b. a first lever having one end abutting said cylinder rod;

c. biasing means for biasing said first lever against said cylinder rod;

d. a shaft rotatably mounted in said vehicle, said first lever being rotatably mounted around said shaft; and

e. first means for activating and deactivating said vehicle's braking system, said first means to communicate with said first lever such that said vehicle's braking system is automatically activated should said hydraulic cylinder experience a presssure decrease, including

i. a second lever fixably mounted on said shaft;

ii. brake actuation means for activating said braking system;

iii. a first actuation rod pivotally mounted to said second lever and in responsive communication with said brake actuation means;

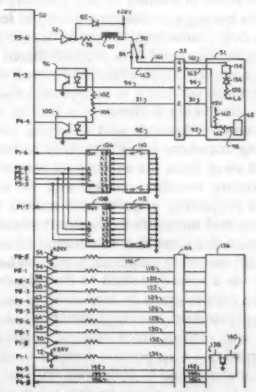
iv. a second actuation rod pivotally mounted to said second lever and in responsive communication with said braking system; and

v. said first lever including a stop member oriented to allow said stop member to abut said second lever such that said vehicle's brakes are activated, whereby, should said hydraulic cylinder experience decreased pressure, said biasing member causes said first lever to rotate placing said stop member in an abutting relationship to said second lever.

4,350,238
DATA ACQUISITION UNIT

Hasmukh R. Shah, Hot Springs, Ark.; Thaddeus M. Jones, and Bruce Hemingway, both of South Bend, Ind., assignors to UMC Industries, Inc., Stamford, Conn.

Filed Apr. 4, 1980, Ser. No. 137,436
Int. Cl.³ G07F *9/08*
U.S. Cl. 194—1 N **21 Claims**



1. A data acquisition unit, which is connectable to a money-operated, multi-selection vending machine that responds to the insertion of money to develop credits and that responds to the actuation of selection switches to initiate vending operations, and which comprises a memory having locations in which resettable data can be stored, a connection between said vending machine and said data acquisition unit which enables said vending machine to transmit data to said data acquisition unit, a switch, a data processing means, and a data-receiving device which is connectable to said data acquisition unit to receive data from said acquisition unit, said data processing means normally responding to data transmitted by said vending machine to store said data in said locations in said memory, said data processing means responding to actuation of said switch to place said data acquisition unit in a data-yielding mode wherein said data processing means transfers said data from said data acquisition unit to said data-receiving device, said

data processing means acting while said data acquisition unit is in said data-yielding mode to yield said resettable data to said data-receiving device while also retaining said resettable data in said locations in said memory, said data processing means subsequently responding to restoration of said switch to its normal condition and to the transmission of further data from said vending machine to be enabled to clear said resettable data from said locations in said memory.

4,350,239

COIN ASSORTING DEVICE FOR A VENDING MACHINE

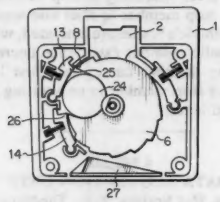
Tadanobu Tsuiki, Fujimishi, Japan, assignor to Cosmos Company Limited, Saitama, Japan

Filed May 13, 1980, Ser. No. 149,534

Claims priority, application Japan, May 15, 1979, 54-59310

Int. Cl.³ G07F *5/04*

U.S. Cl. 194—1 G **8 Claims**



1. A coin assorting device for a vending machine in which a plurality of coins fed in a loose stack are required to operate the machine, the device comprising a plurality of coin assorting members equal in number to said plurality of coins, each of said members having a recess for clearing at least one coin and a respective coin contacting surface to be operated by a coin of a predetermined diameter in a predetermined position in said loose stack, a single rotatable ratchet formed with a single coin slot of a thickness sufficient to accept said stack of coins, said ratchet coin slot being defined by a trailing edge projecting radially outwardly towards said assorting members; each of said assorting members being pivotally mounted for motion towards and away from the axis of said rotatable ratchet; each of said assorting members comprising an edge adapted to contact said projecting edge of said rachet, said edge being positioned on said members to the front of said recess therein with respect to the direction of rotation of said ratchet with respect to said assorting members; a manual handle coupled to said ratchet via a rotatable shaft to directly drive said ratchet and to cause proper coins in said stack in said recess in said ratchet to operate said assorting members; stopper means for preventing said ratchet from reverse rotation, said stopper means comprising a step portion formed in said ratchet and a stopper member adapted to cooperate with said step portion to stop backward rotation of said ratchet when said stopper member is engaged with said step portion, a spring continually urging contact of said stopper member with said ratchet, a plurality of springs corresponding in number to said plurality of coin assorting members, a respective spring of said plurality of springs continually urging contact of a respective one of said members with said ratchet; a frame supporting said plurality of members, said ratchet, said stopper member and said plurality of springs; whereby said projecting edge of said ratchet will engage said edge of one of said assorting members to thereby prevent further forward rotation of said ratchet if a said stack of coins does not include a coin of the predetermined size and in the predetermined position in said stack needed to operate said one member of said plurality of members; said ratchet, said stopper means step portion, said projecting edge of said ratchet, and said assorting and said stopper members all being located with respect to each other such that if an improper coin is in said stack said projecting edge will contact an assorting member edge before said stropper member contacts said ratchet step position, whereby said ratchet can be turned backwards to remove the improper coin from the recess; a plate formed with a coin slot and an aperture through which said rotating shaft passes; and said frame being carried on said plate.

4,350,240

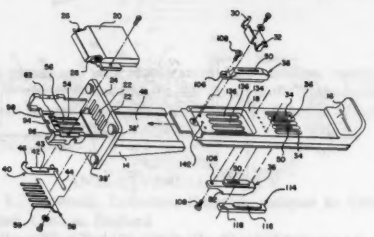
COIN SLIDE WITH INTERCHANGEABLE CORES

Harvey S. Gitlin, Ambler, and John J. Duffy, Glenside, both of Pa., assignors to Equipment Systems & Devices, Inc., Philadelphia, Pa.

Filed May 23, 1980, Ser. No. 152,684

Int. Cl.³ G07F *5/08*

U.S. Cl. 194—92 **30 Claims**



1. In a coin slide of the type including a body adapted to be mounted to function a vending machine, the combination of

a slide movable relative to the body between a coin receiving position and a vending position,

the slide being provided with a plurality of longitudinally aligned core openings;

a plurality of core means respectively secured in the core openings,

at least some of said core means being provided with coin receiving openings,

said coin receiving openings being respectively sized to receive and pass therethrough a coin of predetermined size; and

means to interchange a core means secured within a core opening, said means to interchange comprising a removable fastener interconnecting the core means to the slide,

the core means provided with a coin receiving opening being also provided with a locking edge, the locking edge being adapted to be engaged as the slide is moved from its coin receiving position to its vending position.

4,350,241

MOBILE DELIVERY FLOW EQUALIZER

Jürgen-Michael Wenzel, Düsseldorf, Fed. Rep. of Germany, assignor to Mannesmann Demag, A.G., Fed. Rep. of Germany

Continuation of Ser. No. 33,851, Apr. 27, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 194,676

Claims priority, application Fed. Rep. of Germany, May 18, 1978, 2821674

Int. Cl.³ B65G *41/00, 47/18*

U.S. Cl. 198—311 **4 Claims**

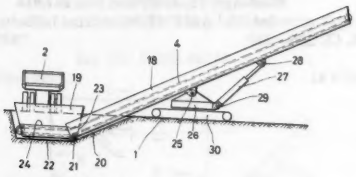
1. A mobile delivery flow equalizer adapted to be placed into an excavation below ground level and adapted to receive and transmit bulk goods from wheeled vehicles, said delivery flow equalizer having an operational mode for receiving and transmitting bulk goods and a transport mode for moving the delivery flow equalizer from one working site to another, comprising

(a) an open-topped bulk goods receiving container;

(b) a supporting frame attached at one end of said container;

(c) an endless conveyor located within said supporting frame;

(d) one end of said conveyor in communication with the interior of said container;
(e) the other end of said conveyor adapted to be placed in communication with a remote processing station;
(f) said container having a horizontal pivoting axis, such that, in the operational mode, the bottom surface of said container is adapted to lie substantially flush upon the bottom of an excavation at various excavation depths beneath ground level and, in the transport mode, said container is supported above ground level;
(g) said container having upwardly extending side walls of predetermined length adapted to extend at least slightly above the ground level when said container is located on the bottom of an excavation;
(h) said side walls of predetermined length being adapted to provide positive stopping surfaces for wheeled vehicles which are driven up to said side walls when said container is located on the bottom of an excavation for unloading bulk goods into said container;



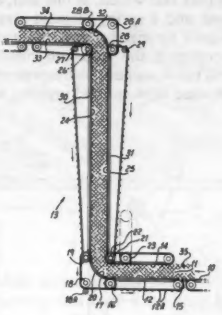
(i) said side walls of predetermined length being adapted to be low enough above ground level when said container is located on the bottom of an excavation as to enable wheeled vehicles to unload said bulk goods into said container from more than a single side of said container;
(j) a transport and tilting means attached to said supporting frame, said transport and tilting means serving to selectively move said delivery flow equalizer from one site to another site and, in addition, serving to move said supporting frame from a first position when said delivery flow equalizer is in its operational mode to a second position when said delivery flow equalizer is in its transport mode; and
(k) said supporting frame holding said container in a cantilevered manner, such that said container is above ground level when said delivery flow equalizer is in its transport mode and below ground level when said delivery flow equalizer is in its operational mode.

4,350,242
CONVEYOR SYSTEMS FOR CIGARETTES AND SIMILAR ROD-LIKE ARTICLES

Dennis Hinchcliffe; Stanley V. Starkey, and William A. Stone, all of London, England, assignors to Molins Limited, London, England

Continuation of Ser. No. 859,708, Dec. 12, 1977, abandoned. This application Feb. 28, 1980, Ser. No. 125,665
Claims priority, application United Kingdom, Dec. 16, 1976, 52473/76
Int. Cl.³ B65G *15/14*
U.S. Cl. 198—605 **32 Claims**

1. A cigarette elevator for conveying upwards a stack-like stream of cigarettes, comprising spaced substantially parallel, upwardly-extending conveyors of which at least one has transversely-extending ribs on its operative face for engaging the cigarettes, a first pulley around which the ribbed conveyor passes at the upper end of the elevator, and a second pulley which is adjacent to the first pulley and has an axis of rotation which is parallel to but laterally spaced from the axis of rotation of the first pulley, and including a substantially-horizontal conveyor which passes around the second pulley, the first and second pulleys being relatively positioned such that the ribs on the ribbed conveyor disappear progressively below the upper run of the horizontal conveyor as the ribs pass around said first

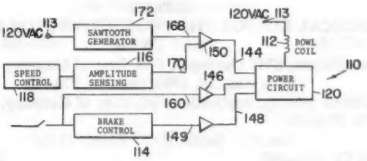


pulley from a point of vertically-upward movement substantially to a point of horizontal movement thereof.

4,350,243
CONTROL CIRCUITRY AND METHOD FOR VIBRATORY FEEDER

Ronald Weyandt, Chesterland, Ohio, assignor to Automated Packaging Systems, Inc., Twinsburg, Ohio

Continuation of Ser. No. 53,104, Jun. 28, 1979, abandoned. This application Apr. 2, 1981, Ser. No. 250,179
Int. Cl.³ B65G *27/24;* H02K *33/14*
U.S. Cl. 198—769 **10 Claims**



1. A vibratory feeder comprising:
(a) a feeder element mounted for vibratory motion relative to a fixed base, said element comprising mechanical structure for feeding articles therefrom in response to vibratory motion of said element;
(b) electromagnetic power means coupled to vibrate the feeder element at a frequency which is a function of an AC line frequency couplable to the power means; and
(c) a braking control circuit coupled to the power means for, in response to occurrence of a stop command, causing the power means to apply energy from the line to the element in pulses at approximately said vibration frequency and timed to actively counteract continued vibratory movement.

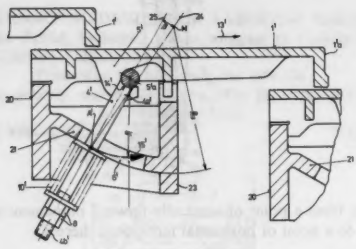
4,350,244
PUSH GRID

Otto Heinemann, Ennigerloh; Heinz-Herbert Schmits, Rheda-Wiedenbruck; Rainer Philipp, Ahlen, and Artur Berger, Beckum, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed Jun. 11, 1980, Ser. No. 158,479
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930406
Int. Cl.³ B65G *25/00*
U.S. Cl. 198—773 **8 Claims**

1. A push grid comprising grid panels which overlap one another and which are alternately fixed and reciprocable longi-

tudinally of the push grid; a grid panel support for each grid panel provided with a web defining a slot-like opening; a tie member which projects through the slot-like opening in each grid panel support and which, at one end, engages the associated grid panel; and a spring element arranged between the other end of each tie member and the web of its grid panel support for engaging the web and biasing the grid panel towards its grid panel support, characterised in that the surface of said web situated adjacent said opening and supporting said



spring element is inclined relative to the horizontal and is offset to the suspension point of the tie member in the longitudinal direction of the push grid with the upper portion of the web about said opening located closer to the point at which the tie member is suspended from the grid panel than the lower portion of the web about said opening, so that the force of gravity tends to urge the tie member along the opening until the spring element engages the surface of the web about the opening is situated at a greater distance from the lower end than from the upper end of the slot-like opening.

4,350,245

MEDICAL KIT FOR THE PROTECTIVE STORAGE OF TEAT SWABS

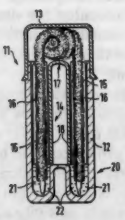
Hans Elstner, 8867 Oettingen, Fed. Rep. of Germany

Filed Aug. 18, 1980, Ser. No. 178,749

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1979, 2934156

Int. Cl.³ B65D *85/20, 85/62, 81/00*

U.S. Cl. 206—207 **20 Claims**



1. A medical kit comprising in combination

a container including

a container body formed with a hollow space in a lower portion thereof, said lower portion being adapted to hold a viscous salve,

a lid at least partly removable from said container body, and

elongated insert means insertable into said container body above said hollow space and having a plurality of upright longitudinal compartmentalized spaces open at each end, and

a plurality of teat swabs arranged to be stored in said compartmentalized spaces, each teat swab being made of a chenille-covered wire for insertion into the milk duct of the udders of lactating cows, and having a rod portion including a lower end part in the form of a rounded plastic tip, and a handle in the form of a spirally rolled upper end,

at least one of said hollow and compartmentalized spaces being arranged to hold said lower end part of one of said swabs, the upper end of each compartmentalized space being arranged to be closed off upon insertion of said rod portion of a swab thereinto,

whereby, upon said viscous salve filling said hollow space at least up to the lower ends of said compartmentalized spaces, contamination of the rod portion of each teat swab is precluded, even when any of the remaining teat swabs are removed from respective of said compartmentalized spaces.

4,350,246

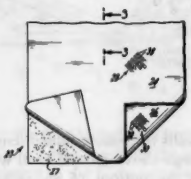
RELEASABLE SURGICAL PRODUCTS AND PROCESS OF FORMATION THEREOF

Nathan Mayer, East Brunswick, N.J., assignor to The Hartford Corporation, New Brunswick, N.J.

Filed Apr. 21, 1980, Ser. No. 141,814

Int. Cl.³ A61B *17/06;* **A61L** *15/00*

U.S. Cl. 206—210 **5 Claims**



1. A surgical product of the type which is folded to be packaged and subsequently radiation sterilized, comprising a moisture absorbent web of fibrous sheet material having a binder present on said surface in a first given pattern so that fibers of said material are exposed at given areas adjacent said first given pattern, and a release agent applied to said surface in a second lattice-like given pattern which overlies a portion of said binder and a portion of said fibers exposed at said given areas.

4,350,247

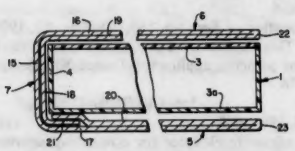
COVERS FOR CASSETTE BOXES

Norman J. Garrod, Great Common, Bletchingley, Surrey, England

Continuation of Ser. No. 968,214, Dec. 11, 1978, abandoned. This application Nov. 25, 1980, Ser. No. 210,335

Int. Cl.³ B65D *65/40*

U.S. Cl. 206—387 **12 Claims**



1. A cover for a box comprising a base and a lid mounted for pivotal movement relative to the base, said cover comprising:

a base panel for overlying the base of the box;

a cover panel for overlying the lid of the box; and

a spine panel having side edges connecting said cover panel to said base panel and of sufficient width to accommodate the box between said cover panel and said base panel;

wherein said spine panel and at least one of said cover and base

panels are each made of two layers of sheet material, the side edges of the outer one of said layers of said spine panel being integrally connected to the other of said cover and base panels and to the outer one of said layers of one of said cover and base panels, one of the side edges of the inner one of said layers of said spine panel being integrally connected to the inner one of said layers of one of said cover and base panels, the other side edge of said inner layer of said spine panel being free of any direct connection with said other of said cover and base panels, said inner layer of said spine panel being free to move relative to the outer layer thereof during relative movement of said base panel and said cover panel.

4,350,248

X-RAY FILM CASSETTE WITH MAGNETICALLY ATTRACTED CONFINING PLATES

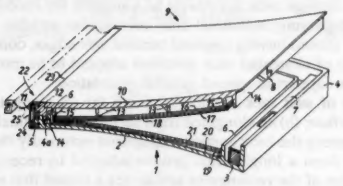
Walter Bauer, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 21, 1980, Ser. No. 142,442

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1979, 2917547

Int. Cl.³ G03B *41/18*

U.S. Cl. 206—455 **18 Claims**



1. A film cassette, especially for x-ray film, comprising a pair of cassette parts movable between an open position and a closed position in which said cassette parts define a film-receiving space; a magnetic plate mounted on one of said cassette parts; a ferromagnetic foil on the other of said cassette parts responsive to the magnetic force of said magnetic plate in said closed position; and means floatingly supporting said foil on said other cassette part, wherein said floatingly supporting means includes an elastic member in the form of a narrow strip-shaped frame arranged at the periphery of said foil and interposed between said other cassette part and said foil, said other cassette part includes a cassette wall which is cylindrically inwardly curved in said open position; and wherein said elastic frame has such a height that said foil at most barely touches said cassette wall at a central region thereof and does not contact said cassette wall at the region within said narrow strip-shaped frame when in said closed position.

4,350,249

VISUAL FILING SYSTEM FOR GEMS, JEWELRY ITEMS, SMALL PARTS AND THE LIKE

Alfred W. H. Caston, 90-17 Francis Lewis Blvd., Queens Village, N.Y. 11428

Filed Dec. 1, 1980, Ser. No. 211,660

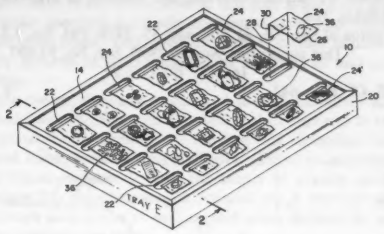
Int. Cl.³ B65D *1/34*

U.S. Cl. 206—566 **6 Claims**

1. A visual filing system for gems and the like comprising, in combination:

a tray having a top layer of substantially rigid material, a bottom layer of substantially rigid material, and a middle layer of resilient material adhered to each of said top and bottom layers, and

a plurality of flexible plastic holding tubes for holding and sealing therein gems, jewelry and the like in locked and protective fashion whereby said gems and the like are prevented from escaping said plastic holding tubes, each of said holding tubes having one closed end and one open end,



said top and middle layers forming a plurality of slots for removably receiving said open end of said holding tubes.

4,350,250

COMPOSITE PACKING

Carl H. Peters, Falsterbo, Sweden, assignor to Platmanufaktur AB, Malmo, Sweden

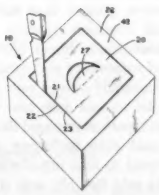
Division of Ser. No. 12,944, Feb. 15, 1979, Pat. No. 4,244,473, which is a continuation of Ser. No. 848,885, Nov. 7, 1977, abandoned. This application Jul. 10, 1980, Ser. No. 168,385

Claims priority, application Sweden, Nov. 17, 1976, 7612865

The portion of the term of this patent subsequent to Jan. 13, 1998, has been disclaimed.

Int. Cl.³ B65D *65/34, 77/36*

U.S. Cl. 206—605 **10 Claims**



1. A packing comprising an outer cover constituted by a relatively rigid material and a filled inner container of relatively flexible material disposed within the outer cover and conforming in shape thereto, said outer cover having opposite ends and including a perimetral rim portion with a central opening at one of said ends, means connecting the inner container to the outer cover only at said rim portion, a plate disposed within the opening in said rim portion, said plate defining a narrow gap with said rim portion which is continuous and extends completely around the periphery of said plate, said plate being constituted of the same material as said outer cover, said plate having an inner surface facing the outside surface of the inner container, and means securing said inner surface of the plate to the outer surface of the inner container such that said plate is secured in said packing only to said inner container and the connection of the plate to the outer container is effected solely through the intermediary of the connection of the inner container to the outer cover by said connecting means, said flexible material of the inner container being cuttable, said gap constituting a guide means for a cutting blade for cutting the inner container so that the plate and the material of the inner container secured thereto are freely removable.

4,350,251

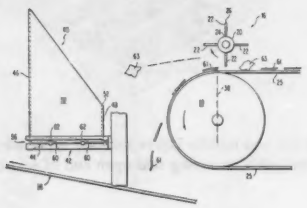
APPARATUS AND METHOD FOR SELECTIVELY EJECTING MALFORMED ARTICLES

Howard W. Merck, Boraville, Ga., assignor to Frito-Lay, Inc., Dallas, Tex.

Division of Ser. No. 31,375, Apr. 19, 1979, Pat. No. 4,224,350. This application Nov. 9, 1979, Ser. No. 92,937

Int. Cl.³ B07C 9/00

U.S. Cl. 209—642 **5 Claims**



1. An apparatus for ejecting selected articles from an array of closely-spaced articles, comprising:

(a) conveyor means for conveying a flexible web along a path, said flexible web having an outer surface for supporting said articles and an inner surface for engagement by conveyor rollers for moving said web along a continuous path;

(b) said flexible web being configured to support said array of articles during movement along said path, said conveyor means having a discharge end for discharging articles of said array;

(c) rotatable ejector means located above and overlying said flexible web adjacent said discharge end for allowing articles in said array of no greater than a preselected vertical dimension to pass beneath said ejector means while ejecting from said array those articles having a vertical dimension greater than said preselected vertical dimension, said rotatable ejector means comprising a plurality of substantially linear blades extending radially from the axis of rotation of said ejector means, said blades extending substantially across said flexible web and substantially parallel to said axis; and whose outer ends are moved through a path above said flexible web with at least a portion of said path including a lowermost position substantially equal to said preselected vertical dimension with respect to said flexible web during rotation of said blades;

(d) said blades being mounted on a hub member and equally spaced peripherally about the hub and extending in a radial direction from the axis of the hub to an extent where the periphery of the blades upon rotation of the hub are positioned above the flexible web at a height slightly greater than a preselected vertical height for ejecting articles from the flexible web that extend above the preselected height, and said blades in their lowermost position being spaced away from the vertical axis of a terminal roller for the flexible web slightly upstream of the path of movement of the articles;

(e) said blades when moving through said portion of said path being moved in the same direction as said flexible web and said axis of rotation extending substantially at right angles to the path of movement of said flexible web; and

(f) means for rotating said ejector means at a substantial differential speed with respect to the speed of said flexible web sufficient to knock said articles of greater vertical dimension selectively from the said layer in a path above the path taken by those articles having a vertical dimension less than the preselected vertical dimension at said discharge end.

4,350,252

DISPLAY RACK

Grant Hopkins, 29½ Lenore, and Mark Cantrell, 150 Wilbur, Box 60, both of Walla Walla, Wash. 99362

Filed Jul. 10, 1980, Ser. No. 168,262

Int. Cl.³ A47F 7/00

U.S. Cl. 211—40 **13 Claims**

1. A storage rack mountable to a support for receiving and fully displaying individual thin rectangular articles such as record albums having opposed parallel side edges, comprising:

a pair of elongated rack members adapted to be mounted to the support in spaced parallel orientation;

each of said rack members having (a) an elongated back surface; (b) an elongated front surface longitudinally overlapping the back surface and spaced outwardly therefrom to form a longitudinal groove adapted to receive a side edge of the rectangular article; (c) a closed first end joining the front and back surfaces and (d) a second end spaced longitudinally from the first end;

a support surface on each rack member projecting from the back surface across said groove toward the front surface adapted to receive and support a side edge of the rectangular article at a location thereon adjacent the side edge received by the longitudinal groove;

article access openings formed between the back surfaces and front surfaces adjacent the second ends of said rack members enabling access to the longitudinal grooves and support surfaces by the rectangular article;

wherein the rack members are mountable to the support with the longitudinal grooves facing one another and spaced apart to receive and support parallel side edges of the rectangular article with the article in an upright, fully exposed position;

a male joint fitting at one end of each rack member; and

a female joint fitting at the remaining end of each rack member for releasably receiving a male fitting thereby enabling the rack members to be connected end-to-end.

4,350,253

BOTTLE STORAGE RACK

Robert K. Rusteberg, Barrington Hills, Ill., assignor to Panlmatic Company, Elk Grove Village, Ill.

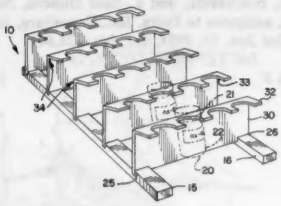
Filed Jun. 19, 1980, Ser. No. 161,045

Int. Cl.³ A47B 73/00

U.S. Cl. 211—74 **5 Claims**

1. A bottle rack for the retention of a plurality of bottles having indicia on the body of said bottles in a manner allowing said indicia to be easily read, said bottle rack comprising a pair of spaced parallel longitudinal mounting means, a support member secured in perpendicular fashion to each of said mounting means, a bottle engaging arm secured in cantilever fashion to the upper end of said support member, said bottle engaging arm extending upwardly at an acute angle of about 20° to about 50° to the horizontal and having a plurality of

indentations along its length, each of said indentations being of a size to receive and hold a neck of one of said bottles, thereby



retaining said bottle at said acute angle for presenting the indicia of said bottle in full view to the user of said rack.

4,350,254

CONTAINER HANDLING AND LIFTING EQUIPMENT, SUCH AS A CRANE OR A GANTRY

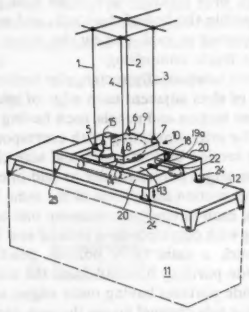
Jean Noly, La Clayette, France, assignor to Potain, France

Filed Dec. 17, 1979, Ser. No. 104,304

Claims priority, application France, Dec. 15, 1978, 78 36063

Int. Cl.³ B66C *13/16*

U.S. Cl. 212—153 **15 Claims**



1. A container handling apparatus for use with an overhead material handling device having four lifting cables, said apparatus comprising:

a four sided fixed part pendantly connected at each corner to each of said lifting cables, said four sided fixed part defining a first plane at the connection of said four lifting cables to said four sided fixed part, said first plane having a center;

a rotating member rotatably mounted below said fixed part for relative rotational movement therewith; said rotating member further comprising:

a lower frame member;

an external frame member mounted adjacent to the periphery of said lower frame member;

a secondary four sided frame member mounted adjacent to the periphery of said external frame member, said secondary four sided frame member having two parallel side rails;

four parallel rotatable members rotatably mounted to the periphery of said external frame, said four parallel rotatable members having a first pair of rotatable members, a second pair of rotatable members and a second plane defined by said four rotatable members, said second plane having a center, said first pair of said four rotatable members further engaging one of said two parallel side rails and said second pair of said four rotatable members further engaging the other of said two parallel side rails, each of said four rotatable members further being mounted to said external frame member so that said center of said second plane defined by said four rotatable members coincides with said center of said first plane defined by the connection of the four cables to said four sided fixed part;

a spreader member pendantly connected to said secondary four sided frame, said spreader member further demountably secured to said container for handling of said container;

moving means, mounted at one end to said secondary four sided frame member and mounted at the other end to said external frame member, for moving said secondary four sided frame member longitudinally relative to said external frame member so that the center of gravity of the weight of the container is located on a vertical axis through said center of said second plane defined by said four rotatable members;

load measuring means, mounted between said lower frame member and said external frame member, for measuring the load in each of said four lifting cables so as to generate a signal having a characteristic indicative of the load in each of said four cables; and

comparison means for receiving each of said signals from each of said four cables of said load measuring means to operate said moving means whenever one of said each of said signals from said measuring means exceeds a predetermined value so that said moving means moves said secondary frame member to equally distribute the load in each of said four cables.

4,350,255

TELESCOPING MOBILE CRANE

Helmut Blase, Dortmund; Arend Högemann, Witten, and Dieter Schulze, Dortmund, all of Fed. Rep. of Germany, assignors to Harnischfeger GmbH, Fed. Rep. of Germany

Filed Jun. 24, 1980, Ser. No. 162,600

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1979, 2926292

Int. Cl.³ B66C *23/06*

U.S. Cl. 212—268 **5 Claims**

1. A telescopic crane comprising:

a first member;

a second member telescopically engaged with said first member;

an idle member telescopically engaged with said second member;

drive means connected to said first member and operatively connected to said second member for extending said second member;

arresting means between said drive means and said idle member for establishing engagement between said drive means and said idle member to extend said idle member;

locking means between said first and second members for establishing engagement between said first and second members to restrain movement of said second member when said drive means extends into said idle member;

said drive means comprising a single piston cylinder arrangement, and including a pin interconnecting one end of said piston cylinder arrangement to said second member and to said idle member when said idle member is in a retracted position, said pin engaged with said idle member when said idle member is in an extended position also;

said arresting means comprising an extension connected to said single piston cylinder arrangement, extending outwardly from said first member for receiving said pin and interconnecting said second member and said idle member to said extension;

a spring loaded bolt connected to one of said idle member and said extension, the other of said idle member and said extension including an oblong slot for receiving said spring loaded bolt to engage said drive means to said idle member; and

a base member pivotally mounted to a carriage and telescopically receiving said first member;

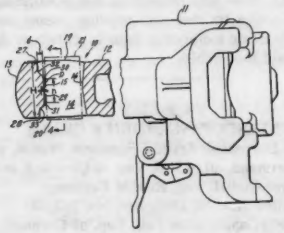
said piston cylinder arrangement comprising a double piston and cylinder arrangement having a first stage connected to said first member and a second stage operatively connected to said second member, with a base stage connected to said base member.

4,350,256

ROTARY COUPLER WITH A SPECIALLY CONFIGURED PINHOLE

Richard M. Hanula, Lyndhurst, and Fred C. Kulieke, Jr., Tallmadge, both of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Sep. 25, 1980, Ser. No. 190,570
Int. Cl.³ B61G *9/020*
U.S. Cl. 213—69 **10 Claims**



1. A railroad car coupler, comprising:

(a) a coupler head;

(b) a shank extending from the coupler head and terminating at a butt end thereof, the shank having a pinhole extending transversely therethrough adjacent the butt end, the pinhole having a pair of opposing ends between which are a backwall in closer spaced relation to the butt end than a frontwall which is spaced from the backwall closer the coupler head, and a pair of sidewalls connecting the backwall and frontwall, the backwall terminating at opposing ends at the opposing ends of the pinhole and including:

(I) a pin bearing surface disposed generally centrally of the backwall for contacting a cylindrical pin that is used to hold the coupler in position on a railroad car, the pin bearing surface being cylindrically curved to matingly engage the cylindrical pin when the coupler is in pull and having a generally rectangular shape defined between a pair of opposing marginal edges which are curved and contained in parallel planes which are generally parallel to planes containing the opposing ends of the backwall; and

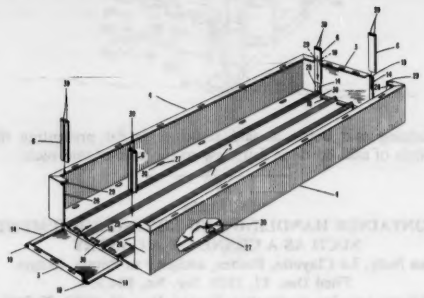
(II) a pair of curved surfaces extending in opposite directions from the pair of marginal edges of the pin bearing surface rearwardly towards the butt end of the shank, the curved surfaces terminating at opposing ends of the backwall rearwardly of the pin bearing surface closer the butt end and being shaped so that the pin bearing surface projects into the pinhole beyond the opposing ends of the backwall a distance (d) such that when a correspondingly measured distance (D) of one-quarter of an inch of the pin bearing surface is worn away, the worn pin bearing surface will still project into the pinhole beyond the opposing ends of the backwall.

4,350,257

KIT FOR ASSEMBLING TOOLBOX ADAPTED FOR INSTALLATION IN BACK OF PICKUP TRUCK AND METHOD OF ASSEMBLING THE TOOLBOX

Hugh F. Groth, Brecksville, and L. Scot Duncan, Northfield, both of Ohio, assignors to Delta, Inc., Jonesburg, Ark.

Filed Jan. 13, 1981, Ser. No. 224,841
Int. Cl.³ B65D *6/12, 6/16*
U.S. Cl. 220—4 F **10 Claims**



1. A kit for assembling a toolbox having upper and lower sections, said toolbox being adapted to extend transversely across the back of a pickup truck, with said lower section fitting snugly within the bed of the truck, and said upper section being supported at each end by the upper edges of the sidewalls of the truck, comprising:

a lower section substantially rectangular bottom panel, having a row of slots adjacent each edge of said panel;

a pair of lower section end panels, each having tab means on one edge for interconnecting with corresponding slots of said lower section bottom panel, and side channel means on opposite edges perpendicular to said one edge;

a pair of lower section side panels of the same height as said end panels, each having tab means on one edge for interconnecting with corresponding slots of said lower section bottom panel, a main body portion, relatively narrow opposite side portions bent 90° from the main body portion, said side portions having outer edges, and said outer edges having side channel means thereon, each of said side channel means to abut a corresponding one of said side channel means of said end panel, when assembled;

four integral locking means for individually slidingly interlocking abutting side channel means of said end panels and side panels;

a pre-assembled upper section; and

means for fastening said pre-assembled upper section to said lower section, when assembled.

4,350,258

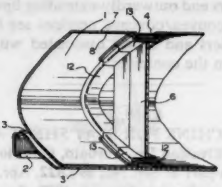
TANK-BAFFLE SYSTEM

R. Barry Rogers, London, Canada, assignor to White-McKee Inc., Elmira, Canada

Filed Oct. 8, 1980, Ser. No. 195,109
Claims priority, application Canada, Jul. 30, 1980, 357329
Int. Cl.³ B65D *25/04*
U.S. Cl. 220—22 **4 Claims**

1. A tank baffle system comprising: a tank, the outer wall of which is constructed of a plastic material, said wall having a portion which defines inwardly indented elongate channel portions on at least the top and the bottom outer surface of the tank with inwardly extending projection portions on the inner surface of the tank complementing and corresponding to said channel portions on the outer surface; a baffle member having a generally planar center portion and an elongate interlocking portion of generally U-shaped cross-section attached to and extending along at least the top and bottom ends of the planar

center portion, said planar center portion being substantially aligned with the vertical axis of said U-shaped portions, said U-shaped portions receiving portions of the inwardly extending projection portions on the inner surface of the tank to



provide a male-female interlocking arrangement; and a strap received in at least a part of the inwardly indented channel portions on the tank outer surface to provide structural rigidity and for use in mounting said tank on a carrying vehicle or other mounting location.

4,350,259

STAINLESS STEEL CONTAINER WITH THERMORADIATING BOTTOM

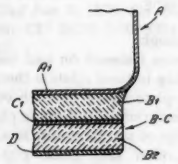
Ferdinando Cartossi, Novara, Italy, assignor to AMC International Alfa Metalcraft Corporation S.A., Rotkreuz, Switzerland

Continuation of Ser. No. 5,723, Jan. 23, 1979, abandoned. This application Sep. 30, 1980, Ser. No. 192,239

Claims priority, application Italy, Jan. 26, 1978, 19689; Mar. 7, 1978, 20974

Int. Cl.³ B02D *20/14*

U.S. Cl. 220—66 **2 Claims**



1. Stainless steel container provided with a first integral heat-radiating stainless steel bottom, a second complemental bottom composed of aluminum or alloys thereof having a first tight restrained bond joining it to a bottom side of the heat-radiating stainless steel bottom, and a steel plate or an iron plate having a second bond securing it to a bottom side of said aluminum bottom, said first and second bonds having physical characteristics resultant from preheating of the bottoms and from then subjecting the heated bottoms to high pressure, a rim of the rolled steel plate being at least partly coated and provided with openings, the aluminum of the layer which forms the bottom of the container extending through the openings in anchored assembly.

4,350,260

LID FOR DRINKING CONTAINERS

Andrew B. Prueher, 1016 N. Sheridan, Highland Park, Ill. 60035

Continuation-in-part of Ser. No. 60,904, Jul. 26, 1979, Pat. No. 4,245,752, which is a continuation-in-part of Ser. No. 947,063, Sep. 29, 1978, abandoned, which is a continuation-in-part of Ser. No. 882,670, Mar. 2, 1978, abandoned. This application Aug. 11, 1980, Ser. No. 176,673

Int. Cl.³ A47G *19/22*; B65D *17/32, 41/26*

U.S. Cl. 220—254 **15 Claims**

1. An improved lid for drinking containers, said lid comprising:

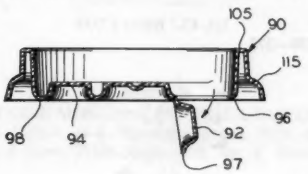
a substantially disc-like main body portion for covering the open end of a drinking container having a beverage contained therewithin;

attachment means for attaching said disc-like main body portion to said open end of the drinking container;

a substantially continuous integrated double-walled mouthpiece means including a substantially vertical first wall portion which emanates upwardly from and peripherally about said disc-like main body portion and a substantially vertical second wall portion which returns downwardly to a position proximate said attachment means;

said double-walled mouthpiece means being positioned separate from and juxtaposed to said attachment means at a position radially inward thereof;

said double-walled mouthpiece means having the substantially vertical first and second wall portions continuously joined at their tops to form a thin insertable protrusion member capable of fitting between the substantially closed



lips of a user to permit comfortable and efficient sampling of beverage temperature by said user's lips;

said double-walled mouthpiece means forming a substantially U-shaped cavity portion therein into which said beverage may flow against both said first and second wall portions, both said wall portions being formed of a relatively thin material to allow said sampling of the beverage temperature by said user's lips;

one or more valve means located in said disc-like main body portion proximate to the radially inner side of the base of said mouthpiece means for alternative release and containment of the beverage located within the container;

said valve means having a closed position and an open position to accommodate said alternative containment and release of said beverage respectively whereby said beverage in said container is kept from spilling while enabling the user to alternatively release liquid from the container for said user's consumption.

4,350,261

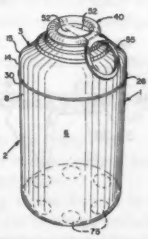
CLOSURE HAVING OPENING MEANS

Donald J. Roth, Westport, Conn., assignor to The Continental Group, Inc., New York, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,519

Int. Cl.³ B65D *17/34*

U.S. Cl. 220—270 **10 Claims**



1. A closure for a container wherein the container is of the

type having a neck joined to an upper end of a frusto-conical body portion and forming a pour aperture, said neck being defined by a smoothly curved outturned extension of said body portion in the form of a rounded curl, said closure comprising a plug fitted within said neck and having a side wall complementally seated against the interior of the neck and having a bottom wall closing said aperture, said side wall and bottom wall having portions expanded radially beneath said neck and said side wall portion and complementally underlapping the upper end of the frusto-conical portion and complementally underlapping the upper end of the frusto-conical portion, and means for rupturing said closure to facilitate removal thereof.

4,350,262

EASY-OPEN CAN CAP WITH A RING PULL TAB

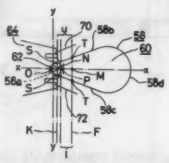
Shunji Kaneko, Ebina, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Oct. 2, 1980, Ser. No. 192,974

Claims priority, application Japan, May 21, 1980, 55-68794[U]

Int. Cl.³ B65D *17/34*

U.S. Cl. 220—273 **8 Claims**



1. An easy open can cap comprising an elongated tear strip defined by a main score, a ring pull tab attached to a starting end portion of said tear strip by a rivet, said main score having a starting end portion extending partially around the area of said rivet and a terminating end portion at the opposite end of said tear strip, said main score also having transitional portions between said starting end portion and said terminating end portion, said transitional portions having a thinner score residual than that of said starting end portion, and auxiliary scores on said can cap having score residual greater than that of said main score, said auxiliary scores being spaced from said transitional portions, said auxiliary scores being formed in said can cap at the same time that said main score is being formed to thereby make it possible to have said score residual of said transitional portions less than the score residual of said starting end portion.

4,350,263

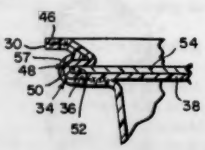
PACKAGE HAVING SEALED CLOSING MEANS

Louis S. Hoffman, Morristown, N.J., assignor to H. P. Hood, Inc., Boston, Mass.

Filed Sep. 19, 1980, Ser. No. 188,848

Int. Cl.³ B65D *41/00*

U.S. Cl. 220—359 **12 Claims**



1. A package comprising a container and lid, a flange at the open top of the container having portions of concavo/convex configuration along at least two sides of the flange defining a groove, a flange at the edge of the lid having portions of convex/concave configuration along at least two sides of the flange defining a rib elastically engaged with the concave/convex groove at the top of the container, the flanges comprising outwardly horizontal portions defining supporting and supported shoulders, upstanding portions defining containing and contained shoulders and outwardly-extending lips and wherein concave/convex, convex/concave portions are formed in the upstanding shoulders and means associated with the lid for disengaging it from the container.

4,350,264

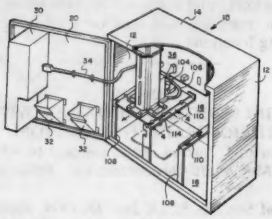
VENDING MACHINE FOR FLAT SHEET ARTICLES

Alois Muller, 138 Elvaston Dr., Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 894,822, Apr. 10, 1978, abandoned. This application Nov. 26, 1979, Ser. No. 97,124

Int. Cl.³ G07F *11/04*

U.S. Cl. 221—67 **20 Claims**



1. An article dispensing unit for use in a vending machine of the type wherein articles are stacked vertically one above one another, and are dispensed downwardly one at a time, said dispensing unit comprising;

base plate means;

an opening therethrough;

mounting block means fastened on said base plate means, around said opening in fixed relation thereto;

at least three guide plate means on each of said mounting block means, at least one of said guide plate means being mounted on an edge of said mounting block means, in one plane, and two other said guide plate means being mounted on extensions of said mounting block means, in parallel spaced apart planes, at right angles to said first mentioned guide plate means, said guide plate means forming part of said mounting block means, and extending downwardly therefrom in fixed relation thereto through said opening in said base plate means, said guide plate means cooperating with one another to guide articles falling through said opening;

article storage means mounted on said mounting block means and extending upwardly therefrom in registration with said opening, and,

article dispensing means movably connected to said base plate means, and being movable relative thereto for dispensing articles from said storage means.

4,350,265

LIQUID DISPENSER METER

Ronald S. Griffiths, Rochester, and John E. Searles, Aylesford, both of England, assignors to A.G. (Patents) Limited, London, England

Filed Oct. 15, 1980, Ser. No. 197,222

Claims priority, application United Kingdom, Oct. 17, 1979, 7936007

Int. Cl.³ B67D *5/22*

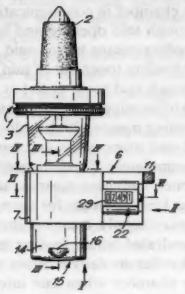
U.S. Cl. 222—38 **19 Claims**

1. A dispenser for dispensing a measured quantity of liquid from a supply thereof, comprising:

(a) dispensing means, actuation of which causes a measured quantity of liquid to be dispensed;

(b) actuating means for selectively actuating the dispensing means;

(c) metering means for recording the number of measured quantities of liquid dispensed, the metering means being operatively connected to the actuating means; and



(d) a housing on which the actuating means and the metering means are securely mounted;

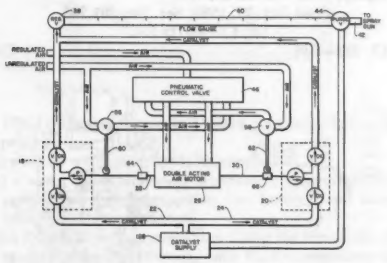
wherein the housing, with its associated actuating and metering means, is readily detachable from the dispensing means.

4,350,266

PUMPING SYSTEM FOR UNSTABLE FLUIDS

Robert D. Hetherington, Sunland, and David W. Goelz, Burbank, both of Calif., assignors to Binks Manufacturing Company, Franklin Park, Ill.

Filed Jun. 8, 1979, Ser. No. 46,969
Int. Cl.³ B67D 5/38; G01F 11/02
U.S. Cl. 222—40 11 Claims



1. A system for pumping unstable fluids comprising:

a pair of single-acting pumps having a predetermined low-volume capacity;

a double-acting air motor for simultaneous operation of said pumps;

pneumatic control means for reversing the operation of said double-acting motor to reverse the operation of said pumps from pumping to filling and vice versa;

said pneumatic control means comprising:

a pair of air pilot valves, each of said air pilot valves including an actuating arm having a roller at the end,

a pneumatic control valve means connected to said air pilot valves for reversing the flow of air to said motor,

said pair of air pilot valves, directly connecting said pneumatic control valve means to a supply of air,

mechanical means coupling said air motor to said pumps and adapted to operate said air pilot valves;

said mechanical coupling means comprising:

a pump piston rod,

an air motor piston rod,

coupling means coupling said pump piston rod to said air motor piston rod,

said coupling means having a cam surface for engaging the roller on said actuating arm to operate one or the other of said air pilot valves proximate the end of a stroke,

fluid supply means commonly connected to inputs of said pumps;

flow control means commonly connected to outlets of said pumps;

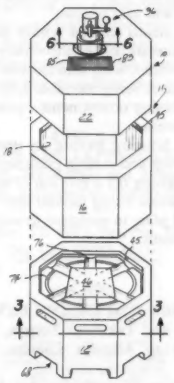
whereby when said motor operates one pump is discharging fluid while the other is taking fluid in and when said motor is reversed, the other of said pumps is discharging fluid while said one pump is taking fluid in so that fluid is pumped at a constant flow rate to said flow control means.

4,350,267

PORTABLE MODULAR BEVERAGE DISPENSER

Richard E. Nelson, 53 E. Tacoma, Clawson, Mich. 48017, and Thomas J. Starr, 31409 Mound Rd., Apt. F, Warren, Mich. 48092

Filed Dec. 26, 1979, Ser. No. 106,929
Int. Cl.³ B67D 1/04
U.S. Cl. 222—131 2 Claims



2. A portable modular insulated container comprising: a base module including a refrigeration unit and having an upper end and a lower end;

a central sleeve module concentrically engageable with the base including a central bore configured to encircle a beverage container;

a cover module concentrically engageable with the sleeve to enclose the container;

a support plate at the lower end abutting a supporting surface;

an evaporator plate at the upper end;

a plurality of support rods extending between the support plate and evaporator plate;

a container centering recess formed in the upper end to engage a flange of the beverage container; and

a plurality of radial recesses formed in the upper end, said radial recesses extending across and ending radially outward from the container centering recess to provide air circulation around the evaporator plate.

4,350,268

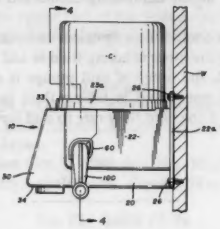
MANUALLY OPERATED DISPENSING PUMP

Charles Potter, Stow, Ohio, assignor to Go-Jo Industries, Inc., Akron, Ohio

Continuation-in-part of Ser. No. 36,763, May 7, 1979, abandoned. This application Apr. 14, 1980, Ser. No. 140,235

Int. Cl.³ B65D *37/00*

U.S. Cl. 222—214 3 Claims



1. A dispenser designed to receive a material supply source, comprising:

(A) a first housing component adapted to support the material supply source;

(B) a second housing component releasably engagable with said first housing components;

(C) an outlet nozzle carried by said second housing component;

(D) flexible tubular means interconnecting the material supply source and said nozzle;

(E) roller crank means carried within said first and second housing components for selective movement into and out of occlusive contact with said flexible tubular means;

(F) said outlet nozzle being movable with respect to said first and second housing components upon movement of said roller crank means;

(G) said second housing having an opening in its bottom wall and a wiping and sealing plate secured to said second housing and closing off a portion of said opening; and

(H) said outlet nozzle being moved into and out of engagement with said plate in response to said movement of said roller crank means.

4,350,269

TONER DISPENSING DEVICE

Yoshihiro Hanada, and Takafumi Tottori, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 15, 1980, Ser. No. 141,612

Claims priority, application Japan, Apr. 26, 1979, 54-56818[U]

Int. Cl.³ G01F *11/24*

U.S. Cl. 222—227 10 Claims

1. A toner dispensing device comprising:

a toner storage chamber having in its lower portion an elongated narrow opening for passing toner therethrough; a cylindrical roller rotatably disposed within the storage chamber parallel to the length of said opening and spaced from and sufficiently close to said opening for substantially filling said opening and for delivering toner from said storage chamber outward through the unfilled part of said opening when said roller is rotated; an intermediate toner supply chamber in communication with said storage chamber through said opening and having a toner outlet and toner feeding means within said intermediate supply chamber for feeding toner out of said intermediate supply chamber through said toner outlet at a constant rate, said intermediate toner supply chamber having a space around said toner feeding means which is closed other than at said opening and said toner outlet and having a size for holding, when completely filled, a predetermined constant amount of toner; and drive means connected to said roller and said toner feeding means for always driving said roller when said toner supply means is driven and for driving said roller and said toner feeding means at speeds for causing said roller to deliver toner to said intermediate toner supply chamber when said intermediate toner supply chamber is not full at a rate greater than the rate of feed of toner by said toner feeding means when said intermediate toner supply chamber is full of toner; whereby said intermediate toner supply chamber accommodates therein a constant amount of toner sufficient only for substantially filling said intermediate toner supply chamber, and the density of the toner within said intermediate toner supply chamber is maintained constant while said toner feeding means is functioning, and when said toner feeding means stops and said intermediate toner supply chamber is filled, said cylindrical roller will not feed further toner even if it keeps rotating.

4,350,270

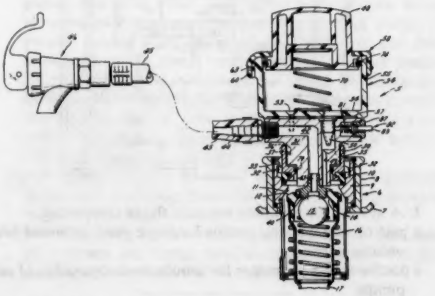
PORTABLE KEG TAPPING COUPLER WITH VENT

James E. Nezworski, Waukesha, Wis., assignor to The Perlick Company, Inc., Milwaukee, Wis.

Filed Oct. 27, 1980, Ser. No. 201,245

Int. Cl.³ B67D *5/42*

U.S. Cl. 222—336 4 Claims



1. A portable keg tapping unit for a keg closure that has an annular gas valve seat at the bottom of an upwardly opening well and wherein an upwardly biased annular gas valve normally engages said gas valve seat and itself comprises a seat for a concentric upwardly biased liquid valve, said keg tapping unit comprising an outer body member receivable in said well and detachably connectable with said closure and an inner body member coaxially movable up and down relative to said outer body member to and from a lowered operative position in which said inner body member holds said gas valve and said liquid valve unseated for flow of pressure gas into the keg and flow of liquid out of the same, said keg tapping unit being characterized by:

A. said inner body member having

(1) a lower portion received in the outer body member,
(2) a substantially coaxial intermediate portion which is above the outer body member, and
(3) an upper portion which comprises a pump chamber wherein a manually actuatable plunger is reciprocable up and down;

E. said inner body member having therein
(1) a liquid passage which opens substantially concentrically to its bottom,
(2) a gas passage which extends downwardly from said pump chamber and opens to its bottom in laterally spaced relation to said liquid passage, and
(3) a vent passage which opens outwardly from said gas passage to one side of said intermediate portion and in which there is a coaxial inwardly facing annular vent valve seat defined by a reduced diameter outer end portion of said vent passage; and

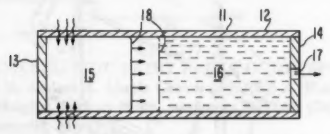
C. a push button valve in said vent passage
(1) having an actuator portion which is axially slidable in said reduced diameter portion of the vent passage and which is accessible at the exterior of the inner body member and
(2) having an enlarged diameter axially inner valve portion which is normally engaged with said vent valve seat but is disengageable therefrom for relief of excess keg pressure by inward manual actuation of said actuator.

4,350,271

WATER ABSORBING FLUID DISPENSER

James B. Eckenhoff, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Aug. 22, 1980, Ser. No. 180,353
Int. Cl.³ A61M *31/00*
U.S. Cl. 222—386.5 **7 Claims**



1. Fluid dispenser for use in a water containing environment comprising:
(a) a rigid, water permeable housing;
(b) a water insoluble, water swellable composition filling a portion of the space within the housing and being in contact with the housing;
(c) a fluid lipophilic composition filling the remainder of the space within the housing, said fluid composition being substantially immiscible in the water swellable composition; and
(d) fluid composition outlet means in the housing that communicates with the fluid composition.

4,350,272

PRODUCT ISOLATED AEROSOL CONTAINER AND METHOD OF MANUFACTURE

Tor H. Petterson, Palos Verdes, Calif.

Continuation-in-part of Ser. No. 93,037, Nov. 9, 1979, abandoned, which is a continuation of Ser. No. 620,691, Oct. 9, 1976, abandoned, which is a continuation of Ser. No. 384,700, Aug. 1, 1973, abandoned, which is a continuation-in-part of Ser. No. 180,790, Sep. 15, 1971, abandoned. This application Oct. 6, 1980, Ser. No. 194,015
Int. Cl.³ B65D *35/28;* B67D *5/54*
U.S. Cl. 222—386.5 **17 Claims**

1. A disposable aerosol barrier package containing
a. a package body having first and second end walls and an intermediate wall extending between and intersecting said end walls, wherein said first end wall has an opening for a discharge valve and said second end wall has a propellant charging plug;
b. sufficient sealing material at the intersection between the intermediate wall and the second end wall to completely fill the intersection and leave no void therein; and
c. a continuous coating of plastic material formed in situ and adhesively and sealingly bonded to at least a major portion of said intermediate wall and to all of said second wall wherein:

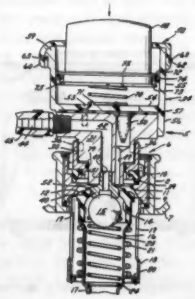
(1) said coating is free from air entrapment between the coating and the confronting wall and has a strength greater than the strength of its bond with said wall,
(2) said coating is free from air entrapment between the coating and the sealing material, and
(3) upon charging the package with a compressible fluid propellant said coating can controllably release from said second wall and said sealing material to form, in situ, a chamber, free from air entrapment, for the propellant charge while the coating remains continuous, under tension and contains the propellant in a compressed state.

4,350,273

PORTABLE KEG TAPPING COUPLER

James E. Nezworski, Waukesha, and John M. Strobel, West Allis, both of Wis., assignors to The Perlick Company, Inc., Milwaukee, Wis.

Filed Jun. 27, 1980, Ser. No. 163,782
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—400.8 **10 Claims**



1. A keg tapping unit for cooperation with a keg that has an upwardly opening wall, lug means projecting radially into said well near the top thereof, an annular gas valve seat at the bottom of said well, an annular gas valve which is biased upwardly for engagement with said gas valve seat and which itself provides a liquid valve seat, and a concentric liquid valve which is biased upwardly for engagement with said liquid valve seat, said tapping unit comprising:

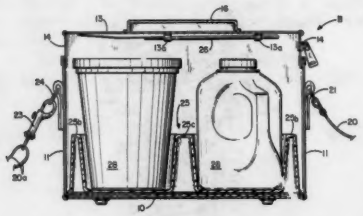
A. a substantially annular outer body member receivable in said well and having
(1) connection means thereon cooperable with said lug means to provide a bayonet connection and
(2) annular seal means at the bottom thereof whereby said gas valve seat is sealingly engaged when said bayonet connection is established;
B. an inner body member having a lower portion substantially concentrically received within said outer body member for axial and rotational motion relative thereto and having a substantially concentric upper portion which projects a substantial distance above said outer body member to be accessible for manual rotation, said upper portion being constrained to partake of all motion of said lower portion, and said inner body member having therein
(1) a liquid passage that opens substantially concentrically to its bottom and
(2) a gas passage that opens to its bottom in laterally spaced relation to said liquid passage;
C. cooperating cam means on said inner and outer body members whereby rotation in one direction of the inner body member relative to the outer body member moves the inner body member downward to a valve-unseating position;
D. valve unseating means on the bottom of said inner body member, operative when the inner body member is in its valve-unseating position and said bayonet connection is established;
(1) to hold the liquid valve off its seat and
(2) to maintain sealing engagement with the gas valve, all around the same, while holding it off its seat;
and
E. an elastic sealing ring confined between said body members to provide a gas seal between them and a frictional connection through which limited torque is transmitted from the inner body member to the outer body member to enable said bayonet connection to be established and subsequent unseating of said gas and liquid valves to be effected by a rotational movement of the inner body member in said one direction.

4,350,274

PORTABLE BAG FOR PET SUPPLIES

Richard T. Morgan, 6614 Annapolis La., Maple Grove, Minn. 55369

Filed Nov. 19, 1980, Ser. No. 208,241
Int. Cl.³ A45C *3/00*
U.S. Cl. 224—205 **1 Claim**



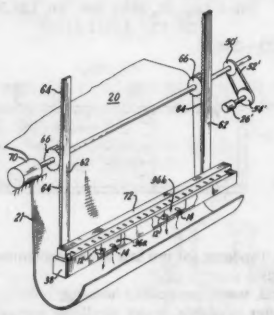
1. A complete package for carrying accessories for household animals comprising,
a carrier bag made from flexible sheet material and having a bottom, upstanding side and end panels,
a dish made from rigid material and having lower portions of the same shape and outer dimensions as the inside of the lower portion of the bag and positioned in the bottom of the bag to maintain the desired bag shape,
a carrier strap connected to the outside of the bag and being adjustable to permit the package to be carried over the shoulder or around the waist of a person using the same,
a cover for the bag hinged on one edge to the top of one of the side panels of the bag and having a 3-sided zipper connecting the other edges of the top to the top of the other panels of the bag,
said dish having a plurality of recessed compartments formed therein with the walls of the compartments spaced inwardly from the upstanding side portions thereof to provide space around the outside of the compartments,
an upstanding rigid container in each of said compartments having side wall dimensions substantially the same as the dimensions of the insides of the compartments and extending substantially to the top of the inside of the bag to support the bag top but having diminished top portions to provide space along the top of each container, and
a plurality of articles carried in the space provided along the side of the diminished top of the containers.

4,350,275

METHOD AND APPARATUS FOR CONTROLLING THE SPEED OF A TRAVELING WEB

William T. Kuhn, 4 Heather Ct., Upper Saddle River, N.J. 07458, assignor to William T. Kuhn, Upper Saddle River; Paul F. Rose, Kinnelon and Thomas H. Rose, Chatham, all of, N.J., a part interest

Filed Oct. 14, 1980, Ser. No. 196,772
Int. Cl.³ B65H *25/12, 23/22, 25/02*
U.S. Cl. 226—14 **32 Claims**



1. Apparatus for controlling the speed of a traveling web being driven along a path by means of first and second drive means located at spaced positions along said path, said apparatus comprising:
emitter means for directing a radiation signal at said traveling web at a predetermined location along said path between said first and second drive means;
detector means for detecting a reflected radiation signal reflected by said traveling web moving along said path, and for generating a position indication signal indicative of the position of said detector means relative to said traveling web at said predetermined location along said path;
moving means responsive to said position indication signal for moving said detector means so as to maintain a predetermined position of said detector means with respect to said traveling web at said predetermined location; and
control means responsive to said moving means for controlling said first drive means relative to said second drive means so as to maintain a predetermined relationship between the speed at which said first drive means drives said web along said path and the speed at which said second drive means drives said web along said path.

4,350,276

ARRANGEMENT FOR ALIGNING A MATERIAL WEB, PARTICULARLY A VENEER WEB

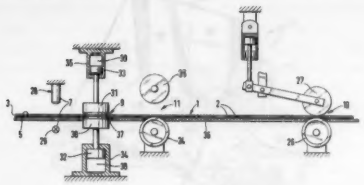
Hans Kreder, Im Asemwald 2/8, 7000 Stuttgart 70, and Horst Weislogel, Marquardtstrasse 15, 7000 Stuttgart 1, both of Fed. Rep. of Germany

Filed Apr. 17, 1980, Ser. No. 141,110

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1979, 2916828

Int. Cl.³ B65H *25/26, 25/24*

U.S. Cl. 226—16 19 Claims



1. An arrangement for aligning a cross line of a material web moving in a given direction along a bearing surface, particularly a veneer web of veneer sheets, with a set portion comprising means for monitoring the position of the cross line and detecting a deviation of the cross line from a set position, retaining means for restraining movement of a leading side of the material web relative to a trailing side of the material web in the direction of movement, said monitoring means being operable to activate said retaining means associated with the leading side to restrain the leading side relative to the trailing side until the actual position of the cross line coincides with the set position, and feed drive means for urging the material in the given direction.

4,350,277

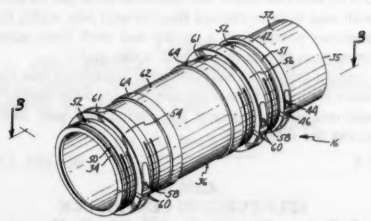
PHOTOGRAPHIC PRINT PAPER GUIDE SPOOL

Richard D. Anderson, Maple Grove, and John A. Wedel, Mendota Heights, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Sep. 16, 1980, Ser. No. 187,830

Int. Cl.³ B65H *17/20*

U.S. Cl. 226—190 11 Claims



1. For use with a photographic printer in which a photographic print paper web is transported from a print paper supply to a print mask location, an interchangeable guide spool for guiding the print paper to ensure proper centering at the print mask location, the guide spool being quickly attached or detached to accommodate a particular paper width by engaging a permanently positioned connective member of the photographic printer having a fixed spatial relationship with respect to the print mask, the guide spool comprising:

a stationary inner sleeve for attachably engaging with one end the permanently positioned connective member of the photographic printer;

a rotatable outer sleeve coaxially and rotatably mounted on the stationary inner sleeve and having an outer surface that engages the photographic print paper; and

guide means attached to the outer surface of the outer sleeve for guiding the print paper;

means for attaching the guide means to the outer sleeve such that the guide means is positioned and set for a particular print paper width.

4,350,278

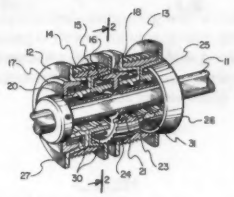
DEMAND DRIVE COMPONENT

Marvin A. Roberts, 7900 Alabama Ave., Canoga Park, Calif. 91304

Filed Oct. 27, 1980, Ser. No. 200,883

Int. Cl.³ B65H *17/20*

U.S. Cl. 226—190 1 Claim



1. In a film transport system comprising the combination of a rotatable shaft, a unitary film support roller arranged for rotation about said shaft;

a substantially rigid central hub portion disposed substantially coaxial with said shaft and arranged to rotate thereabout;

a substantially rigid constant diameter rim portion disposed about and having a larger diameter than said hub;

at least one flexible member connecting said rim portion to said hub portion whereby said rim portion may rotate about said hub at varying radial distances;

means for driving said roller comprising a drive puck arranged to rotate with said shaft and upon radial deflection of said rim portion to engage and drive said roller;

said drive puck coaxially arranged with said shaft, and said hub;

drive puck having an outer peripheral irregular surface which contacts the underside of said roller upon radial deflection of said rim portion;

said roller is provided with at least one lateral cavity defining said roller underside and wherein said drive puck is disposed within said lateral cavity;

said drive puck irregular surface comprising a plurality of spaced apart ridges laterally disposed across the width in parallel relationship;

said drive puck irregular surface includes a central crown mid-way between its side edges and said ridges diverge towards said side edges from said crown.

4,350,279

BATTEN SETTER

Norman S. Haley, 4016 Mapleton Dr., Chantilly, Va. 22021

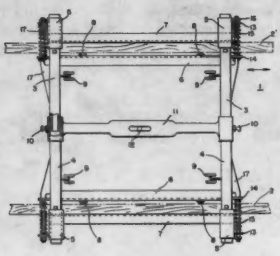
Filed Feb. 26, 1980, Ser. No. 124,848

Int. Cl.³ B27F *7/02;* B43I *13/00;* E04F *21/26*

U.S. Cl. 227—156 14 Claims

1. A batten setter which is adapted to be moved along a surface for spacing batten strips on said surface at a predetermined distance from each other which comprises a first end portion and a second end portion said first and second end portions being connected together by at least one spaced-apart, slidably adjustable frame member, so that the distance between said first and second end portions can be varied depending upon the desired distance between adjacent batten strips, said frame members connecting said end portions in substantially parallel relationships, each of said end portions including first

and second spaced-apart spring-biased guide frames adapted to be positioned on opposite sides of said batten strip for clamping



and sliding along said batten strip, and means for supporting the batten setter on said surface for spacing said batten strips while in said spaced-apart relationship.

4,350,280

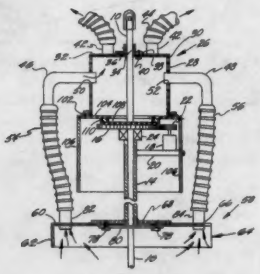
SMOKE EXHAUST APPARATUS FOR A ROTARY WELDER

Stanley K. Kruse, 4122 O'Day Rd., Ft. Wayne, Ind. 46818

Filed May 12, 1980, Ser. No. 148,961

Int. Cl.³ B23K *28/02*

U.S. Cl. 228—29 **5 Claims**



1. Smoke exhaust apparatus for a rotary welder comprising an upright elongated stationary carrier, a support member mounted on said carrier for rotation about and upright axis, plenum and shroud elements vertically spaced apart and connected to said support member for rotation therewith, said plenum having intake and exhaust ports; said shroud including a horizontally disposed plate having a depending skirt around a portion of the periphery thereof to provide an opening in the side of the shroud, smoke inlet ports in said plate, tubing connecting said smoke inlet ports to said intake ports, whereby suction applied to said exhaust ports causes a flow of air through said side opening and from the interior of said shroud upwardly through said smoke inlet ports, through said tubing and intake ports and into said plenum from which said flow passes outwardly of said exhaust ports.

4,350,281

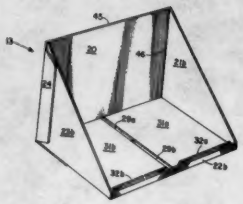
ONE-PIECE SHIPPING CONTAINER WITH CUT-CASE PROTECTION

Arthur H. Dornbusch, and Raymond D. Smith, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 9, 1980, Ser. No. 195,464

Int. Cl.³ B65D *90/04*

U.S. Cl. 229—38 **6 Claims**



1. A corrugated container formed from a unitary blank and having economical cut-case protection, said container comprising:

(a) a pair of end walls and a pair of side walls integrally connected in alternating side-by-side relation;

(b) said end walls each having an integrally connected bottom closure flap, which flaps together form an outer coplanar section of a bottom closure;

(c) at least one of said end walls having an integrally connected top closure flap;

(d) said side walls each having integrally connected at its top end a side wall liner flap of substantially the same dimension as said side walls folded inwardly into face-to-face contact with said side walls;

(e) said side walls each having a bottom closure flap integrally connected by a first score line and which flaps together form an inner coplanar section of said bottom closure;

(f) said bottom closure flaps of said side walls each having a partial end wall liner flap integrally connected therewith along a second score line perpendicular to the associated said first score line and adjacent an end thereof;

(g) said partial end wall liner flaps being located at the same end of said container and folded at an angle of about 90° with said bottom closure flaps of said side walls, forming coplanar portions of a partial end wall liner across the lower part of one of said end walls; and

(h) printed matter on said container indicating that the container is opened by cutting across said lower part of one of said end walls, adjacent the partial end wall liner, and across the side walls.

4,350,282

SELF-PURGING CENTRIFUGE

Denis J. Dudrey, Bloomington, and John T. Herman, Mahtomedi, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Dec. 23, 1980, Ser. No. 219,502

Int. Cl.³ B04B *1/00*

U.S. Cl. 233—7 **22 Claims**

1. A self-purging centrifuge comprising:

(a) a drum having a side wall and a top wall member, mounted for rotation about a generally vertical axis;

(b) a rotor assembly coaxially mounted in said drum for independent rotation with respect to said drum, said rotor assembly comprising a plurality of nested discs having downwardly sloping, spaced surfaces and having the outer peripheral edges thereof spaced a substantial distance from said side wall of said drum, said rotor assembly

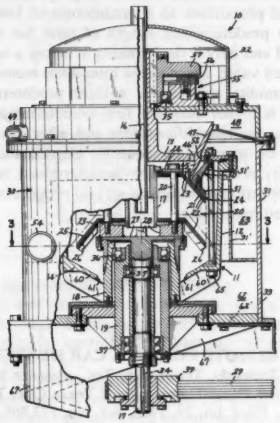
including aligned disc portions with apertures therein allowing light liquid flow therethrough;

(c) means for introducing into said drum a fluid comprising liquids of differing densities and solid particles;

(d) means for rotating said rotor assembly, said fluid rotating therewith, and said rotating fluid in turn causing rotation of said drum;

(e) said drum top wall member having portions with inner and outer radially spaced liquid discharge openings therein;

(f) an annular baffle member extending generally downward



from said top wall member intermediate said inner and said outer openings, said baffle member guiding liquid overflow from said rotor assembly apertures into said inner openings of said top wall member;

(g) extension means on said drum for preventing fluid and solids carryover into said liquid discharge openings during a purge cycle;

(h) means for defining a solid particles collection area adjacent said drum side wall; and

(i) means for slowing the rotation of said drum, to initiate a purge cycle, said fluid and particles draining from said drum over said baffle during the purge cycle.

4,350,283

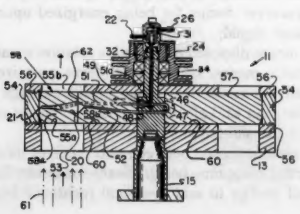
CENTRIFUGAL ELUTRIATOR ROTOR

Armen L. Leonian, Woodside, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 1, 1980, Ser. No. 164,983

Int. Cl.³ B04B *11/00*

U.S. Cl. 233—26 **8 Claims**



1. A centrifuge rotor adapted for continuous separation and collection of specific particles from mixed populations thereof, comprising:

a rotor adapted to be supported on a centrifuge drive shaft for rotation thereby;

said rotor having elutriator cell housing means with at least two equally spaced-apart elongated cavities disposed symmetrically with respect to the axis of rotation of said rotor;

a fluid delivery spindle disposed in said rotor and extending along the axis of rotation thereof, said spindle having fluid inlet and outlet passages therethrough, said passages having inlet and outlet apertures communicating with each of said elongated cavities;

elutriator cells disposed in at least two of said elongated cavities, said elutriator cells having inlet and outlet openings on one end thereof registering with said corresponding apertures in said spindle in face-to-face contact therewith for receiving and delivering fluid to and from said spindle passages;

said spindle having one end connecting with a stationary housing having rotating seals and stationary inlet and outlet ports to enable continuous loading and unloading of said elutriator cells while said rotor is rotating.

4,350,284

TRANSFERRING MEANS FOR USE IN A DEVICE FOR SEPARATING LIQUIDS

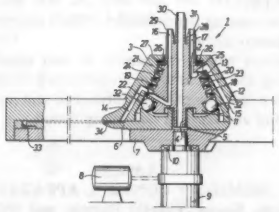
Friedrich Rosemeier, and Helmut Kerber, both of Hechingen, Fed. Rep. of Germany, assignors to Gambro Dialysatoren KG, Fed. Rep. of Germany

Filed Sep. 26, 1980, Ser. No. 191,253

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1979, 7908037

Int. Cl.³ B04B *1/00*

U.S. Cl. 233—27 **8 Claims**



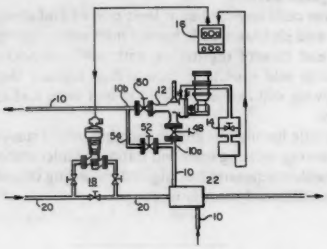
1. A device for collecting a liquid which has been separated into at least first and second fractions, said first fraction having a higher density than said second fraction, said device comprising a stationary transferring element and a housing for said stationary transferring element, said housing being rotatable about an axis of rotation for said device, said housing and said stationary transferring element providing a fluid communication space therebetween for fluid communication between said housing and said stationary transferring element, said housing including first and second outlet passages for passing said first and second separated fractions through said housing to first and second points in said fluid communication space, and said transferring element including first and second outlet channels for passing said first and second separated fractions from said first and second points in said fluid communication space through said transferring element, and wherein said first point in said fluid communication space is positioned radially outwardly from the axis of rotation of said device with respect to said second point in said fluid communication space so that when said housing is rotating the separation of said first and second fractions in said fluid communication space is maintained at least partially by centrifugal force.

4,350,285

VISCOSITY REGULATING APPARATUS AND METHOD

Eugene F. Holben, Haddonfield, N.J., assignor to Conometer Corporation, Gibbsboro, N.J.

Filed Jan. 21, 1981, Ser. No. 226,742
Int. Cl.[3] G05D *24/00*
U.S. Cl. 236—1 R 17 Claims



1. Apparatus for regulating the viscosity of a fluid flowing through a fluid line comprising:

a fluid line;

housing means connected between two points in said fluid line for flowing fluid from said fluid line through said housing means and for returning fluid flowing through said housing means to said fluid line;

first and second flow restrictors having identical flow restriction characteristics;

pump means connected between said first flow restrictor and said second flow restrictor for diverting a portion of fluid flowing through said housing means through said first flow restrictor, said pump means and said second flow restrictor;

means for sensing the pressures of fluid entering and leaving said pump means;

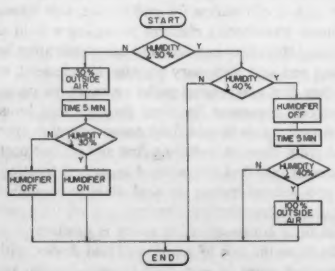
and control means responsive to said sensing means for varying the viscosity of fluid flowing through said fluid line as a function of the difference in said pressures of fluid entering and leaving said pump means.

4,350,286

HUMIDITY CONTROL APPARATUS

Shinji Sutoh, Konan; Takeshi Harada, and Shinichi Kaneko, both of Higashi Matsuyama, all of Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Aug. 18, 1980, Ser. No. 179,314
Claims priority, application Japan, Aug. 20, 1979, 54-105677
Int. Cl.[3] G05D *21/00;* F24F *7/00*
U.S. Cl. 236—44 A 9 Claims



1. An apparatus for controlling a humidity in an enclosure including duct means having an outlet opening into the enclosure, a recirculated air inlet communicating with the enclosure and an outside air inlet, proportioning means for controlling a proportion of air entering the duct means from the outside air inlet relative to air entering the duct means from the recirculated air inlet and humidifier means for, when energized, increasing a humidity in the enclosure, characterized by comprising:

humidity sensor means for sensing the humidity in the enclosure; and

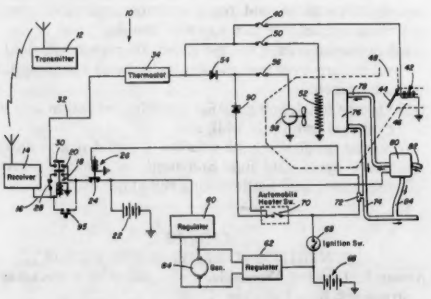
control means responsive to the humidity sensor means and constructed to, when the humidity drops below a first predetermined value, control the proportioning means to set said proportion to a predetermined low value and, after a predetermined length of time has subsequently elapsed and only if the humidity is below a second predetermined value, energize the humidifier means, and; when the humidity rises above a third predetermined value which is higher than the first predetermined value, deenergize the humidifier means and, after a predetermined length of time has subsequently elapsed and only if the humidity is above a fourth predetermined value, control the proportioning means to set said proportion to a predetermined high value.

4,350,287

REMOTE CONTROL CAR HEATER

Kennith E. Richards, Texas City, Tex., assignor to Thomas E. Mackey and Donal Haire, both of Texas City, Tex.

Filed Jul. 29, 1980, Ser. No. 173,901
Int. Cl.[3] B60H *1/02*
U.S. Cl. 237—12.3 A 9 Claims



1. A remote control auxiliary car heater comprising:

transmitter means for transmitting a start signal;

receiver means for receiving said transmitted start signal;

electrical resistance heater means operatively connected to said receiver means for being energized upon receipt of said start signal;

blower means disposed in operative relation to said electrical resistance means, said blower means energized by being operatively connected to said receiver means for causing airflow over said electrical resistance means upon receipt of said transmitted start signal;

a thermostat disposed between said receiver means and said electrical resistance heater means for controlling application of energy to said electrical resistance heater means; and

airflow control means operatively connected to said receiver means for controlling airflow from said blower means and directing said airflow to a windshield of an automobile.

4,350,288

FLUID FUEL HEATING SYSTEM

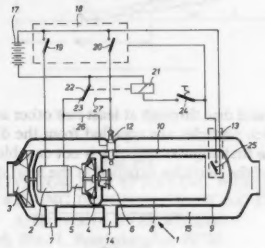
Joerg Hermann, Gauting; Werner Baier, Gauting-Stockdorf, and Josef Breidbach, Feldafing, all of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH and Co., Munich, Fed. Rep. of Germany

Filed Aug. 7, 1980, Ser. No. 176,149

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1979, 2931936

Int. Cl.³ B60H 1/02

U.S. Cl. 237—12.3 C 2 Claims



1. A fluid fuel heating system comprising:

(a) a burner unit having a combustion air blower, an electric motor drivingly connected to said blower, and an incandescent plug for igniting the fuel-air mixture only during a starting period; and

(b) a powering circuit operatively connected to said electric motor and said incandescent plug for supplying electric power thereto, said powering circuit having circuit means for selectively incorporating said incandescent plug into said powering circuit in series with said electric motor as a series resistor to reduce the blower rpm after completion of the starting period.

4,350,289

SELECTIVELY CONTROLLED AIR CONDITIONER OUTLET SYSTEM OF A VEHICLE

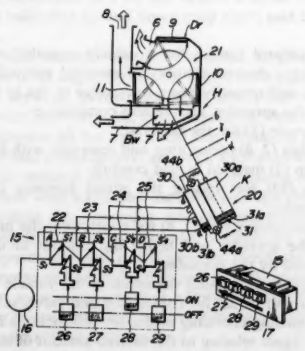
Yukio Shimada; Naoyoshi Suzuki; Toshio Ohashi, all of Yokohama, and Yasushi Inoshita, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 12, 1980, Ser. No. 206,260

Claims priority, application Japan, Nov. 15, 1979, 54-147065

Int. Cl.³ B60H 1/02

U.S. Cl. 237—12.3 A 6 Claims



1. In a selectively controlled air conditioner outlet system for an air conditioner including a heater unit (H), said system provided with blowing outlets (Bw) for blowing out conditioned air to various portions of a cabin of a vehicle, a door (Dr) for controlling the amount of the blowing out conditioned air for each one of the blowing outlets (Bw), a vacuum source (16), and a driving device (K) coupled thereto through a vacuum selector (15), wherein by selection on the vacuum selector (15), the driving device (K) is operated in a predetermined condition and, by the driving device (K), the degree of opening of said doors (Dr) can be controlled, the improvement comprises that the driving device (K) is formed of a shift actuator (20) having a vacuum cylinder (30) and a piston (31), and the vacuum selector (15) is provided with a plurality of selecting buttons (26) (27) (28) (29) and a corresponding number of vacuum switches (22) (23) (24) (25), that said vacuum cylinder (30) is provided with a plurality of supply taps (a) (b) (c) (d) for supplying a unidirectional negative pressure signal only at one location corresponding to a position of one of a plurality of predetermined positions (A) (B) (C) (D) obtained by depressing one of the selecting buttons of the vacuum selector (15), and that the outlet system includes

means for supplying the negative pressure signal to none of the supply taps when none of the selecting buttons is depresssed and for supplying the negative pressure signal to any one of the supply taps when a corresponding one of the selecting buttons is depressed, means for shifting the piston to a predetermined position when the negative pressure signal is supplied to any one of the supply taps, and a link mechanism connecting the piston to the doors, for moving predetermined one or more doors to a predetermined condition in response to the movement of the piston.

4,350,290

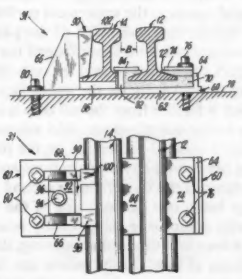
RESILIENT RAIL FASTENER ASSEMBLY FOR CURVED TRACK

Charles J. Bush, Woodridge, N.J., assignor to New York City Transit Authority, Brooklyn, N.Y.

Filed Mar. 24, 1980, Ser. No. 132,895

Int. Cl.³ E01B 5/18

U.S. Cl. 238—17 5 Claims



1. A resilient rail fastener assembly for a paired load carrying and parallel guard rail combination, said assembly comprising:

a one-piece base plate adapted to receive said load carrying and guard rails and having a planar base portion, said base plate further including an upstanding shoulder disposed at one end of said base portion adjacent said load carrying rail, said base plate further including a pair of integrally formed spaced, generally planar upstanding brace plates disposed in parallel relationship on the opposed end thereof adjacent said guard rail and oriented transverse to the longitudinal axis of the length of said rails;

an elastomeric pad positioned between the upper surface of said base portion and the bottom of said load carrying rail; and

wedge means interposed between said brace plates and said guard rail, said wedge means including an upstanding

portion and a horizontal portion, said upstanding portion of said wedge means including two spaced tapered segments, each segment being disposed between said guard rail and one of said brace plates, said horizontal portion of the wedge means being fixedly connected to the base portion of said base plate with the upstanding portion of said wedge means being in abutting relationship with the upper portion of said guard rail such that the centrifugal forces imparted to said curved guard rail by rolling stock moving therealong is transferred from said guard rail through said wedge means and said brace plates into said base portion whereby said guard rail is maintained in a vertical orientation and noise and vibration are substantially reduced.

4,350,291

RAILWAY RAIL-FASTENING CLIP AND A RAILWAY RAIL-AND-FASTENING ASSEMBLY

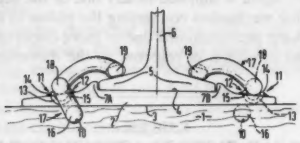
George D. Dobson, Baulkham Hills, Australia, assignor to Pandrol Limited, London, England

Filed Feb. 12, 1980, Ser. No. 120,922

Claims priority, application United Kingdom, Feb. 15, 1979, 7905443

Int. Cl.³ E01B *9/48*

U.S. Cl. 238—349 **5 Claims**



1. An assembly on a railway track comprising a cross tie, portions of the tie defining an opening in it, a metal plate with a flat bottom lying on the tie, an upward projection on the plate, a flange-footed rail lying on the plate, and a rail clip comprising an upwardly bearing, substantially straight leg driven into said opening, the uppermost part of said leg lying at most 2 mm. below the flat bottom of the plate, a second part bearing downwardly on the upper face of the flange of the rail and a third part, connected to said leg only by a single reverse bend, bearing downwardly on the upper face of the plate at a location which is further from the rail than is said leg, considering only the horizontal direction, said assembly further comprising a second upward projection on the plate, the flange of the rail being between the two projections and located by both of them, portions of the tie defining a second opening in it, the two openings being one on each side of the rail flange, and a second rail clip comprising an upwardly bearing substantially straight leg driven into the second opening, the uppermost part of said leg lying at most 2 mm. below the flat bottom of the plate, a second part bearing downwardly on the upper face of the flange of the rail and a third part, connected to said leg only by a single reverse bend, bearing downwardly on the upper face of the plate further from the rail than is said leg of the second clip, considering only the horizontal direction.

4,350,292

CENTRIFUGAL FEEDER

Ian D. Gilbert, St. Albans, England; Michael T. Halloran, Pembroke Pines, and Ermi Roos, Hialeah, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Dec. 27, 1979, Ser. No. 107,704

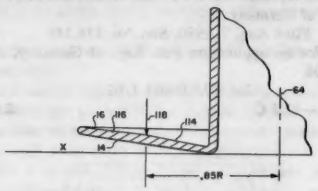
Int. Cl.³ B05B *17/04*

U.S. Cl. 239—7 **19 Claims**

1. A method of operating a centrifugal feeder having a substantially cylindrical feeder disc of generally conical configuration with an upwardly inclined generally concave surface symmetrical about a vertical axis comprising the steps of:

feeding an amount of particulate material onto the feeder disc surface,

rotating said disc at a first angular velocity at which particles are expelled from the disc surface, and



rotating said disc through at least one other angular velocity at which particles are expelled from the disc surface,

wherein the first angular velocity is not capable of causing the expulsion of the particles expelled at the least one other angular velocity.

4,350,293

VEHICLE EQUIPPED WITH A LIQUID SPREADER DEVICE

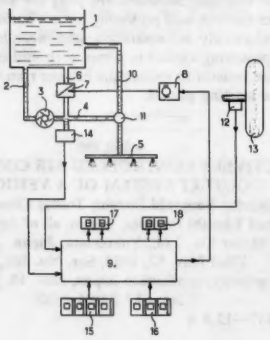
Maurice C. J. Lestradet, 291 Avenue du Marechal de Lattre de Tassigny, 51230 Fere Champenoise, France

Filed Sep. 16, 1980, Ser. No. 187,802

Claims priority, application France, Oct. 15, 1979, 79 25546

Int. Cl.³ A01C *23/04;* B05B *9/06;* G05D *7/06*

U.S. Cl. 239—155 **6 Claims**



1. A control system for a vehicle mounted spreader for dispensing a desired quantity of material per unit of surface area (Q), said quantity being responsive to the to the pressure (Pm) in the spreader, said system comprising:

a reservoir (**1**) for the material;

a conduit (**2, 4**) connecting said reservoir with the spreader;

a pump (**3**) inserted in said conduit;

means (**14**) for sensing the actual pressure (Pm) in the spreader;

a controllable valve (**7, 8**) for controlling the pressure (Pm) in the spreader and hence the amount of material dispensed by the spreader;

means (**12**) for sensing the speed of the vehicle (V); and

a controller (**9, 25**) for controlling said valve, said controller comprising encoding means for producing a digital quantity signal relating to the desired amount of material to be spread per unit area (Q), encoding means for producing a digital parameter signal (k) relating to the type of spray nozzles incorporated in the spreader, interface means responsive to said pressure sensing means and speed sensing means for providing digital pressure (Pm) and speed

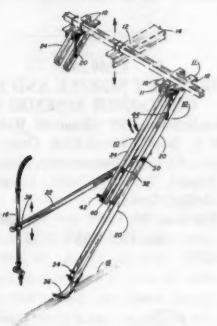
signals (V), and a microprocessor coupled to said encoding means and said interface means for producing a digital desired system pressure signal (Pcal) corresponding to the system pressure necessary to provide a desired material quantity per unit area, said microprocessor being responsive to said digital desired pressure signal (Pcal) and said digital system pressure signal (Pm) for producing a digital correction signal, said controller being connected to said valve for actuating said valve in accordance with said correction signal for causing the actual pressure to approach the necessary system pressure.

4,350,294

SPRAY CULTIVATOR FOR SPRAYING WEEDS UNDER CROPS OF VARYING HEIGHTS GROWING ON LEVEL AND NON-LEVEL FIELDS

Martin Gaspard, Rte. 1, Batchelor, La. 70715

Filed Oct. 14, 1980, Ser. No. 196,729
Int. Cl.³ B05B 1/20
U.S. Cl. 239—169 5 Claims



1. A spray cultivator for spraying the tops of weeds growing under crops of varying heights on rolling fields, and said cultivator being attachable to a lift bar behind a prime mover for pulling said cultivator up and down crop rows, said cultivator comprising:

(a) rigid side element means of unequal lengths pivoted together in an angularly flexible frame defining a parallelogram between pivots and with free ends extending downward and rearward, said frame being fixed normal to the cultivator lift bar by a frame side extending longitudinally of said prime mover, and with a forward element of said side element means pivotally depending to engage and follow with a free end the surface of said rolling field for pivoting the remaining side element means of said angularly flexible frame to remain respectively parallel to the respectively fixed and depending remaining side element means and with the free end of said remaining side element means opposite and parallel to said fixed side element means being kept at a constant height and attitude above said rolling field; and

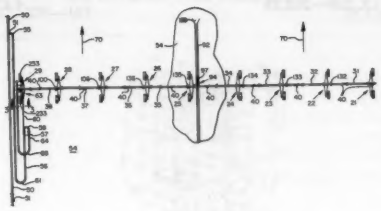
(b) spray pipe and nozzle means adjustably mounted on said free end of side element means opposite said longitudinally extending fixed side element means for spraying weeds at a constant attitude and height above a rolling field of changing levels.

4,350,295

LINEAR MOVE DEVELOPMENTS

Lyndle G. Gheen, Eugene, Oreg., assignor to Pierce Corporation, Eugene, Oreg.

Filed Feb. 8, 1980, Ser. No. 119,845
Int. Cl.³ A01G 25/09
U.S. Cl. 239—178 17 Claims



1. In an irrigation line move, hose means resting on the ground and adapted for connection at one end thereof to a source of water;

an irrigation line move including a pipe connected to the other end of the hose means and carriage means for moving the pipe;

cable means connected to a portion of the hose means;

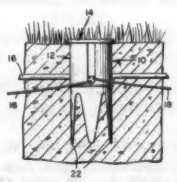
and winch means on a portion of the line move for alternately pulling the cable means in to drag the hose means along the ground toward the line portion and for paying the cable means out.

4,350,296

ACCESS SLEEVE FOR DRIP IRRIGATION EMITTERS

Ora F. Kuhlman, Portuguese Bend, and Samuel Tobey, Encino, both of Calif., assignors to Technical Irrigation Products, Inc., Lawndale, Calif.

Filed Jun. 12, 1980, Ser. No. 158,915
Int. Cl.³ A01G 25/06
U.S. Cl. 239—201 9 Claims



1. In an irrigation system having a distribution hose to which an emitter is attached for supply of water to soil, the improvement in permitting protective burial of said hose and said emitter in the soil comprising:

a sleeve having an opening at the surface of and extending into the soil and about said emitter and portions of said hose secured thereto, said sleeve further having at least one slot with a base at the bottom thereof for supporting said hose; and

a cap removably secured to said sleeve at its opening for closing said sleeve and enclosing said hose and said emitter within said sleeve and for permitting access thereto, said cap including a tubular extension fittably interengageable with said sleeve and extensible into butting engagement with said hose to secure said hose at said slot base and within said sleeve.

4,350,297

SWIVELLING EXHAUST NOZZLES FOR ROCKET MOTORS

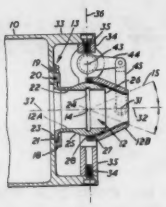
Frank Martin, Cranford La., Heston, Middlesex, England

Filed Jul. 5, 1962, Ser. No. 207,821

Claims priority, application United Kingdom, Jul. 5, 1961, 24371/61

Int. Cl.[3] F02K 9/84

U.S. Cl. 239—265.35 4 Claims



1. A rocket motor having a body and an exhaust nozzle which comprises a tubular main part fixed to the motor body and a hollow nozzle extension containing the nozzle mouth, with an exhaust axis, the extension being sealed to the main part of the nozzle by means of a universal joint of the spherical ball-joint type, a gimbal ring supported by the body of the motor and pivotally connected thereto about a first pivot axis transverse to the nozzle exhaust axis, the nozzle extension being pivotally supported in the gimbal ring for pivotal movements about a second pivot axis transverse to the nozzle exhaust axis and normal to the said first pivot axis, means for turning the gimbal ring relative to the motor body about the first pivot axis, including first actuating means with a first linkage operatively connected to the gimbal ring, and means for independently turning the nozzle extension relative to the gimbal ring about the second pivot axis, including second actuating means with a second linkage operatively connected to said nozzle extension, said second linkage including a first shaft supported in a bearing carried by the motor body for rotation about a fixed axis perpendicular to said first pivot axis, a second shaft supported by the gimbal ring on an axis parallel to said second pivot axis and operatively connected to said nozzle extension, and a universal coupling whose center lies on said first pivot axis, operatively connected between said two shafts.

4,350,298

FOAM DISPENSER

Tetsuya Tada, Tokyo, Japan, assignor to Canyon Corporation, Tokyo, Japan

Filed Aug. 13, 1980, Ser. No. 177,933

Claims priority, application Japan, Aug. 16, 1979, 54/104454; Sep. 5, 1979, 54/113987; Jan. 28, 1980, 55/8446

Int. Cl.[3] B05B 9/043

U.S. Cl. 239—333 7 Claims

1. In a foam dispenser for foaming a liquid mixed with air supplied from an air supplying means after the liquid is discharged from an orifice formed in a foam dispenser body and is scattered at the bottom of a nozzle cap located in front of the orifice, the improvement wherein said nozzle cap includes:

a plurality of arms at the bottom of said nozzle cap which form an obstacle wall with which the spray liquid from said orifice collides,

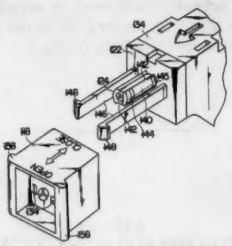
a plurality of foam outlet ports defined between adjacent ones of said arms so that scattered spray and freely flowing liquid streams are alternately formed adjacent to one another;

a sealing member which extends from the bottom of said nozzle cap for selectively sealing off said orifice in said foam dispenser body;

said nozzle cap being movable relative to said foam dispenser body between a sealing position whereat said sealing member seals off said orifice and a foaming position whereat said orifice is not sealed so that the spray stream from said orifice may be foamed;

at least one pair of through holes formed in said nozzle cap;

and wherein said foam dispenser body includes a pair of cantilever support arms extending from said foam dispenser body and having locking means at the free end of at least one of said support arms; and



said nozzle cap being slidably mounted to said pair of cantiliver support arms which respectively extend through said pair of through holes in said nozzle cap, said locking means being engageable with said nozzle cap for preventing said nozzle cap from falling off from said support arms.

4,350,299

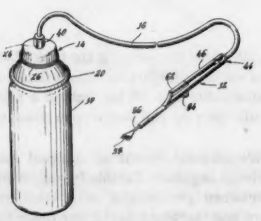
REMOTE DELIVERY NOZZLE AND PRESSURIZED CONTAINER ASSEMBLY

George M. Stephenson, 190 Chestnut Ridge, Bethel, Conn. 06801; David L. Begin, Brookfield, Conn.; Roger Casavant, Winsted, Conn.; Stephen Bornemeier, Ridgefield, Conn., and William J. Colucci, Danbury, Conn., assignors to George M. Stephenson, Bethel, Conn.

Filed Jun. 30, 1980, Ser. No. 164,319

Int. Cl.[3] B05B 7/32

U.S. Cl. 239—337 23 Claims



10. A wand for a remote delivery nozzle assembly adapted to be connected to a pressurized container comprising:

an elongated member having a substantially parallel inlet and outlet passage,

remote valve means in a transverse bore between said inlet and outlet passage in said wand, for selectively controlling the release of the pressurized contents from said container, said valve means including

reciprocably mounted plunger means in said transverse bore for opening and closing communication between said inlet and outlet passage in response to movement thereof,

flexible membrane means on said wand member for contact with said plunger means to impart movement to said plunger means in response to pressure applied thereto, and

a cap member adapted to be seated on said flexible mem-

brane means for imparting pressure to said flexible membrane means when pressed.

4,350,300

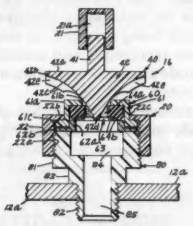
IRRIGATION SYSTEM AND CONSTANT VOLUME SPRINKLER HEAD THEREFOR

Merle A. Vikre, 32 Windward Way, Gulf Harbors New Port Richey, Fla. 33552

Continuation-in-part of Ser. No. 199,094, Oct. 20, 1980, and Ser. No. 971,038, Dec. 19, 1978, Pat. No. 4,231,523, which is a continuation of Ser. No. 765,266, Feb. 3, 1977, abandoned, said Ser. No. 199,094, is a continuation of Ser. No. 000,069, Jan. 2, 1979, abandoned. This application Apr. 24, 1980, Ser. No. 143,413

Int. Cl.[3] B05B *1/26, 1/30*

U.S. Cl. 239—396 49 Claims



1. A spray head device for use in center pivot irrigation systems for distributing a spray of water, comprising:

frame means defining an upper carrying member and a lower housing disposed in spaced relation, the lower housing adapted for connection to a source of water;

water jet means carried by the lower housing defining an inlet for receiving water and an outlet of predetermined size constructed to issue a jet of water, the outlet disposed in opposition to the upper carrying member;

volume control means associated with the water jet means for controlling the jet of water so that its volume output is substantially constant, the volume control means comprising a resilient washer retained within the water jet means and having a control opening disposed in alignment with and immediately adjacent the outlet of said water jet means, the resilient washer having a normal unstressed state in which the control opening permits the flow of a maximum volume of water, and the range of stress states in which the control opening becomes progressively restrictive, the resilient washer being disposed within the water jet means so that the incoming water acts on and stresses the water as a function of water pressure;

and diffuser means supported by said upper carrying member in overlying relation to the housing outlet for impingement by the jet of water and constructed to disperse the water radially outward into a flow pattern of predetermined configuration, the diffuser means comprising a circular member having a peripheral edge and defining an undersurface that tapers axisymmetrically to split the jet of water substantially evenly and deflect it laterally outward over the undersurface, said undersurface having a plurality of grooves formed therein which extend radially outward to said peripheral edge.

4,350,301

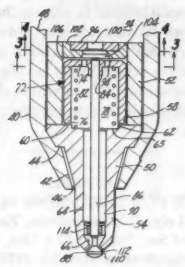
FLOW CONTROLLED PRESSURE REGULATING DEVICE

Louis R. Erwin, Livonia, and Granville W. Hurlong, Jr., Southfield, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jun. 25, 1980, Ser. No. 162,985

Int. Cl.[3] B05B *1/32;* F02M *61/08*

U.S. Cl. 239—453 25 Claims



1. An apparatus for delivering fluid, the apparatus being adapted to receive fluid from a pump means, wherein the pump means has means for delivering fluid at a determinable flow rate, the apparatus comprising:

fluid receiving means for receiving the delivered fluid;

spray tip means in fluid communication with said fluid receiving means comprising:

a hollow body having a fluid passage therethrough;

valve means for selectively opening and closing said fluid passage and for establishing a variable area orifice therein;

pressure regulating means comprising piston means reciprocatively mounted within said body and having at least one control orifice therein, for moving said valve means and for modulating the area of said variable area orifice to regulate the fluid pressure within said passage at a relatively constant value and for regulating the velocity of the fluid flowing from said variable area orifice independent of the quantity of flow therethrough.

4,350,302

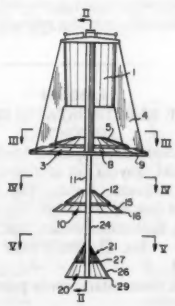
LIQUID SPRAY NOZZLE

Martin V. Gruber, and Mahendra F. Doshi, both of Tampa, Fla., assignors to Zurn Industries, Inc., Erie, Pa.

Filed Sep. 19, 1980, Ser. No. 188,627

Int. Cl.[3] B05B *1/26*

U.S. Cl. 239—500 6 Claims



1. A nozzle including a body portion having a throat with a discharge orifice, a first splash plate, means mounting said first

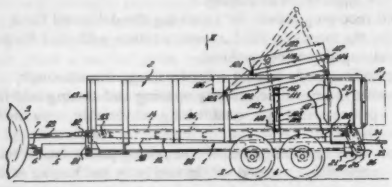
splash plate below and coaxial with said discharge orifice, a second splash plate, means mounting said second splash plate below and coaxial with said first splash plate, a third splash plate, means mounting said third splash plate below and coaxial with said second splash plate, each of said first and second splash plates having an axial opening formed therein and said third splash plate including a conical portion coaxial with said axial openings, each of said first, second and third splash plates having a plurality of slots extending therethrough, said slots in said first and second splash plates being arcuate and parallel to the edge of the splash plate in which they are located, said arcuate slots being located radially outwardly of said axial opening in each of said first and second splash plates and extending substantially continuously around the complete circumference of the splash plate in which they are located, and means for mounting said nozzle on the exterior surface of a distribution pipe.

4,350,303

DEVICE FOR SPREADING MATERIAL

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 839,311, Oct. 4, 1977, Pat. No. 4,232,831. This application Dec. 10, 1979, Ser. No. 101,765
Claims priority, application Netherlands, Oct. 4, 1976, 7610949
Int. Cl.³ A01C *17/00, 19/00*
U.S. Cl. 239—673 **60 Claims**



1. A spreader comprising a hopper for containing material to be spread, said hopper having a floor and a delivery outlet at one end of said floor, and two rotary distribution members arranged adjacent said delivery outlet and adapted to rotate about a substantially vertical axes at least in part in said outlet and over said floor, each said distribution member comprising a carrier and resilient working members mounted thereon, said carrier extending in at least generally the same direction as the axis of rotation of said distribution member and being spaced from said axis, each said working member including said working members nearest said floor mounted to extend for its entire length over said floor during part of its rotation, the paths of rotation of said two distribution members extending together approximately the enitre width across said delivery outlet and individually substantially meeting midway across said delivery outlet.

4,350,304

ROTARY TYPE ELECTROSTATIC SPRAY PAINTING DEVICE

Matsuyoshi Sugiyama, Susono; Teru Morishita, Shizuoka, and Toshikazu Suzuki, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 9, 1980, Ser. No. 185,433
Claims priority, application Japan, Apr. 4, 1980, 55-43454
Int. Cl.³ B05B *5/04*
U.S. Cl. 239—703 **15 Claims**

1. A rotary type electrostatic spray painting device comprising:

a metallic housing;

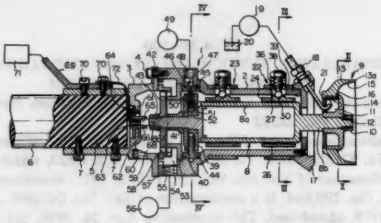
a metallic rotary shaft rotatably arranged in said housing and having a front end and a rear end;

a cup shaped metallic spray head fixed onto the front end of said rotary shaft and having a cup shaped inner wall;

feed means for feeding a paint onto said cup shaped inner wall;

drive means cooperating with said rotary shaft for rotating said rotary shaft;

non-contact type radial bearing means arranged in said housing and cooperating with said rotary shaft for radially supporting said rotary shaft under a non-contacting state;



non-contact type thrust bearing means arranged in said housing and cooperating with said rotary shaft for axially supporting said rotary shaft under a non-contacting state;

terminal means for receiving a negative high voltage, said terminal means being arranged on said metallic housing;

electrode means arranged in said metallic housing and having an electrode arranged to continuously contact the rear end of said rotary shaft; and

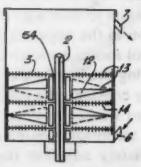
electrical interconnection means for electrically coupling said electrode means to said housing for applying said negative high voltage to said spray head.

4,350,305

MICRO-MILL-MIXER

Jacques J. B. van Hoorn, Brussels, Belgium, assignor to Colortex S.A., Luxembourg, Luxembourg

Division of Ser. No. 894,238, Mar. 28, 1978, Pat. No. 4,214,712. This application Apr. 30, 1980, Ser. No. 145,015
Claims priority, application Belgium, Apr. 28, 1977, 0/177082
Int. Cl.³ B02C *23/36*
U.S. Cl. 241—46 B **13 Claims**



1. A micro-mill mixer comprising in combination:

an enclosure for treating material, the material including particles carried in a fluid,

an inlet means in said enclosure for introducing material to be treated into said enclosure, an outlet means for discharging from said enclosure material for which treatment has been completed,

an abrasive member having at least one face provided with an abrasive coating forming hard, sharp crystalline cutting points,

at least one accelerator propeller providing both centrifugal and centripetal motion of said material, said propeller having blades for projecting the fluid and particles toward the abrasive member, and means for effecting flow of material into said accelerator propeller, so that ejected material continuously re-enters the accelerator propeller to effect repetitive circulation,

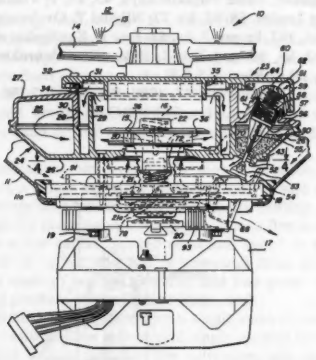
said propeller and said abrasive member being positioned relative to one another so that the particles and the fluid are projected onto said abrasive member and against said abrasive coating to produce intense splitting, slicing and particle shearing as well as fluid division jointly with coating of said particles by said fluid to form an intimate mix, and said propeller and abrasive member being furthermore positioned so as to provide a continuous repetitive circulation of said particles and fluid over said abrasive member.

4,350,306

CHOPPER FOR DISHWASHER SOIL SEPARATOR

Geoffrey L. Dingler; Wilbur W. Jarvis, both of St. Joseph Township, Berrien County, and Raymond W. Spiegel, Lincoln Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 22, 1980, Ser. No. 189,784
Int. Cl.³ B02C *18/10*
U.S. Cl. 241—46.15 **12 Claims**



1. In a soil separator for use in a dishwasher having wall means defining a pump chamber, a liquid impeller in said chamber, an inlet opening to said chamber, and a generally flat filter screen extending across said inlet to prevent passage of solid matter of a size greater than a preselected size to said chamber, an improved chopper for chopping such large size solid matter caught by the screen to reduce it to a size permitting passage through the screen with the liquid being drawn through said screen by the impeller, said chopper comprising:

a hub;

means for rotating said hub closely adjacent the upstream side of the screen about an axis perpendicular to said screen; and

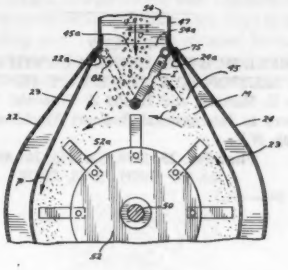
a chopping blade carried by the hub and defining a cutting edge extending outwardly from the hub substantially parallel to said screen, said blade being turned relative to a plane parallel to said screen to define means for causing turbulent agitation of the liquid immediately upstream of the screen for preventing adherence of the large size solid material to the upstream side of the screen, whereby said cutting edge chops the large size food particles caused to be agitated by said turned blade as it is swung annularly about said axis by the rotating hub.

4,350,307

TWO-SIDED MAGNETIZED DIVERTING PLATE FOR HAMMERMILL

Gerald R. Olson, Rte. 2, Box 256, Shakopee, Minn. 55379

Filed Feb. 1, 1980, Ser. No. 117,460
Int. Cl.³ B02C *13/286*
U.S. Cl. 241—81 **7 Claims**



1. A hammermill having therein an entry chute for incoming material leading into a grinding chamber and a hammer assembly mounted within said grinding chamber, in which the improvement consists of

a hammermill housing,

a grinding chamber within said housing,

an entry chute leading into said housing,

a plate member disposed between said entry chute and said grinding chamber,

means carried by said housing supporting said plate member,

said plate member having a length to traverse the width of said entry chute and of said grinding chamber,

the upper surface portion of said plate member extending across the path of incoming material through said entry chute,

the underlying surface portion of said plate member extending across the path of material circulating within said grinding chamber,

said upper and underlying surface portions of said plate member being magnetized

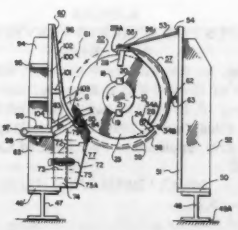
whereby said plate member attracts and extracts tramp iron from incoming material passing into said housing through said entry chute and from material circulating within said grinding chamber.

4,350,308

SHREDDING MACHINE AND COMPONENTS THEREOF

John C. Brewer, Salt Lake City, Utah, assignor to Garbalizer Corp. of America, Utah

Filed Apr. 11, 1980, Ser. No. 139,392
Int. Cl.³ B02C *18/18*
U.S. Cl. 241—294 **9 Claims**



1. For mounting to a revolving shaft, a blade-holder with a radially outwardly projecting protuberance having a forward-

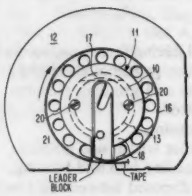
ly-facing blade-backing surface and also provided with a slot proximate said blade-backing surface, said slot having opposed surfaces, a blade seated in said slot, engaging said opposed surfaces and disposed against said blade-backing surface, said blade having a work-impact forward surface positioned above said slot, and elongate securement means disposed above and outside said slot and projecting through said blade, above and over said slot, and into said protuberance.

4,350,309

TAPE REEL HUB INCLUDING A CANTILEVER BEAM SECTION TO REDUCE TAPE TENTING

Maurice E. Richard, and Daniel J. Winarski, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 23, 1980, Ser. No. 161,808
Int. Cl.³ B65H *75/18, 75/28*
U.S. Cl. 242—68.3 **9 Claims**



1. A reel for winding magnetic tape, including a hub member adapted to be rotated about an axis in both directions, the rotation of said member in one of said directions causing said tape to be wound under known tension on said hub member in a plurality of layers generating a predetermined radial inward compression force on said layers and said hub which is proportional to said known tension, said hub member including a generally continuous cylindrical tape receiving surface one predetermined portion of which is adapted to receive an end portion of the first layer of the tape to be wound on said hub, one outer circumferential section of said hub defining a cantilever beam of circumferential length L and radial depth W, one side of said beam being coextensive with said predetermined portion, said length and depth of said cantilever beam being determined in accordance with the modulus of elasticity of the material of said one outer circumferential section and said radial inward compression force to control the bending action of the distal end of said beam, whereby the tendency of a discontinuity associated with said end portion of said first layer of said tape to adversely affect subsequent layers of said wound tape is reduced since the controlled bending action of the distal end of said cantilever beam decreases said radial force to a point which prevents the tape from tenting when it is unwound.

4,350,310

APPARATUS FOR BRAKING TRAVELLING STRIP MATERIAL

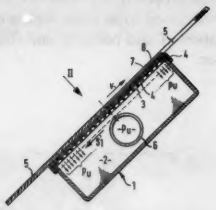
Peter Fröhling, An den Klippen 9; Franz F. Schulz, Krähenwinkel 6, both of D-5960 Olpe, Biggesee, and Karl Wiedemer, Hubertusweg 19, D-5900 Siegen, all of Fed. Rep. of Germany

Filed Dec. 9, 1980, Ser. No. 214,731
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1979, 2949902
Int. Cl.³ B65H *23/10, 23/18*
U.S. Cl. 242—75.2 **3 Claims**

1. A device for the simultaneous braking of a plurality of parallel running strips comprising:

a box connectable to a source of negative pressure, the box having side and bottom walls cooperating with each to define an enclosed space and a perforated upper surface forming a slide base;

an air-permeable covering positioned on top of said slide base and contacting lower surfaces of the strips so that the lower surfaces of the strips are suction attracted towards



and into sliding contact with the air-permeable covering; and

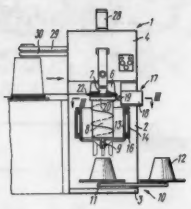
an air-impermeable covering positioned on said air-permeable covering to cover portions of the air-permeable covering not contacting said strips.

4,350,311

WIRE COILING MACHINE

Igor K. Pokhodnya, ulitsa Chkalova, 41-a, kv. 25; Valery N. Shlepakov, ulitsa Pushkinskaya, 45, kv. 9; Vladimir F. Alter, ulitsa Lenina, 88/92, kv. 77; Nikolai T. Ovcharenko, prospekt Nauki, 103, korpus 3, kv. 53; Igor P. Kaplienko, ulitsa Lenina, 88/92, kv. 66, and Petr I. Rak, ulitsa Dobrokhotova, 6, kv. 17-a, all of Kiev, U.S.S.R.

Filed Nov. 17, 1980, Ser. No. 207,790
Int. Cl.³ B21C *47/00*
U.S. Cl. 242—83 **5 Claims**



1. A wire coiling machine comprising:

a frame,

a wire bundling means mounted on said frame and including a rotatable coil forming capstan,

a rotatable accumulator drum mounted below said capstan in axial alignment therewith and including movable normally extended support fingers for accumulating wire coils that come from said continuously rotating capstan,

means for retracting said movable normally extended support fingers, whereby the accumulated wire coils are free to fall down;

a wire cutting assembly disposed at the level where deposition of wire coils in a bundle is terminated and including a percussion cutter unit mounted on said frame for rotation around a vertical axis,

an anvil associated with said wire bundling means for rotation around the axis of rotation of the same wire bundling means and having a surface of revolutions for taking an impact load from said cutter unit when the wire is cut at the instant a bundle of wire coils has been deposited;

means for establishing a fixed rotational ratio between said capstan and said accumulator drum, whereby wire coils of a desired size are invariably formed.

4,350,312

FISHING REEL

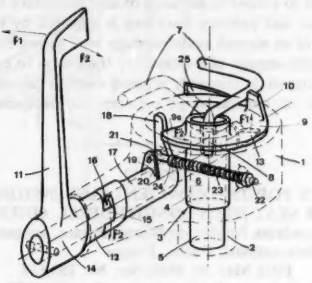
Jean Masclet, 11 Boulevard Davout, 75020 Paris, France

Continuation of Ser. No. 930,993, Aug. 4, 1978, abandoned. This application Mar. 10, 1980, Ser. No. 128,464

Claims priority, application France, Aug. 5, 1977, 77 24159

Int. Cl.³ A01K *89/01*

U.S. Cl. 242—84.2 G **9 Claims**



1. In a fishing reel of the type described, said fishing reel having a body supporting a rotatable spool having an ejectable line thereon, a spool driving means, and a line guide pivoted about an axis fixed relative to the body and which is transverse to the direction of ejection of the line, a pair of line guide supports, said line guide having two ends, one of which is received by each of said supports, the improvement comprising:

a mechanical double monostable toggle switching means forming a single assembly including one of said supports and comprising means axially for axially shifting said one support for pivoting said line guide from a first position in which a line can be wound onto said spool to a second position in which the line is unwound from said spool during casting, and for pivoting said line guide from the second position to the first position; and

said switching means including a single control lever coupled to said shifting means, said single control lever being rotatable in one direction for activating said means for shifting said one support to cause pivoting of said line guide from the first position to the second position, and said single control lever being rotatable in another direction opposite to said first direction for activating said means for axially shifting said one support to cause pivoting of the line guide from the second position to the first position, said line guide remaining in each of its said positions until its placement is changed by said single control lever.

4,350,313

BELT WIND-UP ROLLER FOR VEHICLE-SAFETY BELTS WITH BLOCKING DEVICE

Heinz D. Adomeit, Berlin, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

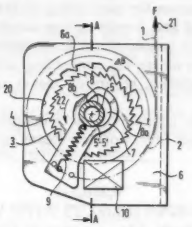
Continuation of Ser. No. 95,928, Nov. 20, 1979, abandoned, which is a continuation-in-part of Ser. No. 865,856, Dec. 30, 1977, abandoned. This application Feb. 5, 1981, Ser. No. 231,665

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1976, 2646238

Int. Cl.³ A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 C **5 Claims**

1. Belt wind-up roller for vehicle safety belts having a wind-up roller in a housing for winding up a withdrawable belt that is supported on a rotatable shaft, blocking means for blocking rotation of the rotatable shaft with a sudden acceleration of the belt-withdrawal, to prevent a further withdrawal-or-pulling out of the belt, said blocking being effected by means of at least one blocking member which is supported on the axis of the belt wind-up roller which latter is slidably arranged in the housing, a spring exerting a force retaining the wind-up roller in position so that at a sudden acceleration of the belt pull, the axis of the wind-up roller is, at least on one side, displaced in a direction transverse to the roller axis against the force of the spring, a counterlocking part, said blocking member having at least one locking part which comes into engagement in the blocked state with the counterlocking part in the form of a tooth with



a tooth flank disposed on the housing in an angular range of approximately 120°; beginning approximately 10° before the roll-off point of the belt, in the roll-off direction of the belt, said counterlocking part constructed with a contact surface on the tooth flank which, when engaged by said locking part, forms a contact region between the two, said contact surface being disposed at the withdrawal side of the wind-up roller such that a plane parallel to the axis of the belt wind-up roller and which has a tangent from the roll-off point of the belt locking in the roll-off direction of the belt intersects said contact surface of the tooth flank thereby causing the force on the belt resulting from said belt pull to be absorbed by the counterlocking part and locking part.

4,350,314

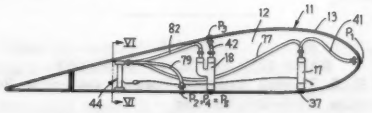
WING MOUNTED STALL CONDITION DETECTOR

Arthur W. Hoadley, Portage, Mich., assignor to The Board of Trustees of Western Michigan University, Kalamazoo, Mich.

Filed Jul. 10, 1980, Ser. No. 168,838

Int. Cl.³ G01C *21/00*

U.S. Cl. 244—1 R **8 Claims**



1. In an aircraft instrument system for use on a winged aircraft, comprising an indicator visibly displaying a linearly variable ratio of a first pressure differential between a first pressure at a first location on said wing and a second pressure at a second location on said wing spaced from said first location and a second pressure differential between a third pressure at a third location on said wing and a fourth pressure at a fourth location on said wing spaced from said third location, first means responsive to said first, second, third and fourth pressures for producing plural electrical signal outputs indicative of the individual pressures thus detected, electrical circuit means responsive to each of said electrical signal outputs for producing a quotient signal representing said linearly variable ratio and second means for effecting a connection of said

quotient signal to said indicator to render said indicator responsive to said quotient signal, the improvement comprising:

compartment means inside the wing of said winged aircraft, said first means being received in said compartment means;

securement means for securing said first means in said compartment means;

first, second, third and fourth orifice means providing communication between the exterior and interior of said wing;

air-water-sediment separator means and third means for securing said air-water-sediment separator means in said compartment means, said air-water-sediment separator means having means defining an air-water-sediment inlet, an air outlet and an intermediate sediment collection chamber;

first conduit means for connecting at least one of said first, second, third and fourth orifice means to said air-water-sediment inlet on said air-water-sediment separator means;

second conduit means for connecting said air outlet on said air-water-sediment separator means to said first means; and

third means for connecting the remainder of said first, second, third and fourth orifice means to said first means.

4,350,315

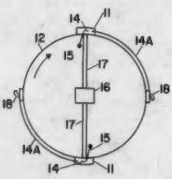
DEVICE TO DE-SPIN OBJECTS WITH VERY HIGH SPIN

Irvin Pollin, Bethesda, Md., assignor to The United Staates of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 27, 1980, Ser. No. 153,461

Int. Cl.³ F42B *13/32*

U.S. Cl. 244—3.23 **18 Claims**



1. A method of de-spinning a body rotating at a very rapid rate, comprising the steps of:

attaching a set of expendable masses to the body, each member of the set comprising two identical masses disposed symmetrically on the body, and

sequentially detaching each member of the set of expendable masses.

4,350,316

RAMP FOR AIRCRAFT TAKE-OFF

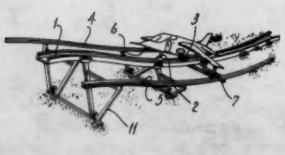
Ernest D. R. Thomas, Banstead, England, assignor to British Aerospace, Weybridge, England

Filed Mar. 20, 1980, Ser. No. 132,116

Claims priority, application United Kingdom, Mar. 22, 1979, 7910092

Int. Cl.³ B64F *1/00*

U.S. Cl. 244—63 **2 Claims**



1. A ramp along which an aircraft, having a wheeled undercarriage of the type having two main units in tandem and two stabilizing units disposed one to each side of the main units, travels during take-off including:

a single primary trackway on which the wheels of the main units roll;

twin secondary trackways spaced one to each side of said primary trackway on which the wheels of the stabilizing units roll; and

support means arranged to both support said trackways at a desired acclivity and to maintain their lateral spacing, said primary trackway alone having guide means, provided with a wider entrance mouth, which guide the undercarriage so that the wheels are prevented from deviating off the trackways, and being of such a length and so positioned to extend in advance of said secondary trackways so that said primary trackway is engaged by both main units of an aircraft undercarriage well before the stabilizing units engage said secondary trackways to ensure that the aircraft is correctly aligned even at take-off speeds before its undercarriage engages said secondary trackways.

4,350,317

DEVICE FOR THE RESILIENT SUSPENSION OF A VEHICLE SEAT WITH LONGITUDINAL ADJUSTMENT

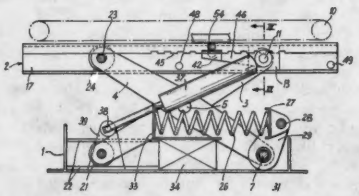
Bernard Aondetto, Nogent sur Marne, France, assignor to Sable Freres International, Pantin, France

Filed May 20, 1980, Ser. No. 151,615

Claims priority, application France, Jun. 28, 1979, 79 16704

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—588 **4 Claims**



1. A device for the resilient suspension of a vehicle seat, comprising: a bottom frame to be mounted on the vehicle,

longitudinal guides in said bottom frame,

a top frame on which the seat is to be mounted,

longitudinal guides in said top frame,

vertical guiding means for guiding the vertical displacement of said top frame with respect to said bottom frame,

resilient means applied against said bottom frame and operatively connected to said top frame in order to urge said top frame in an upward direction,

a bearing slidably mounted within each of said top frame longitudinal guides,

said vertical guiding means comprising scissors-type levers pivotally connected at one end respectively to said bottom frame and to said bearings, a pivot pin for the pivotal connection of said scissors-type levers to said bearings, the ends of said levers being caused to slide within said bottom frame longitudinal guides and within said top frame longitudinal guides,

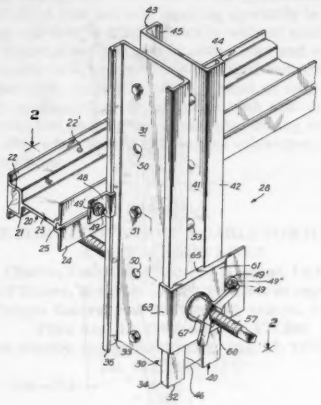
locking means interposed between at least one of said bearings and the longitudinal guide of the top frame in which said bearing is slidably mounted for locking said top frame longitudinal guides in a selected longitudinal position on said vertical guiding means,

said locking means comprising a catch pivotally mounted directly on said pivot pin, said catch comprising means to directly engage said top frame longitudinal guide which directly supports said seat.

4,350,318
TIE PLATE

Anthony J. Gallis, Lake Hiawatha, N.J., assignor to Harsco Corporation, Camp Hill, Pa.

Filed Jan. 15, 1981, Ser. No. 225,202
Int. Cl.³ E04G 17/02, 17/08
U.S. Cl. 249—40 15 Claims

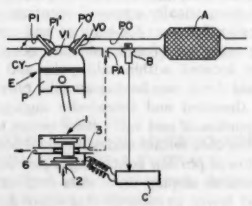


1. A connector plate adapted to be mounted on the outer flanges of a pair of U-shaped channels joined in back-to-back spaced relation as a concrete forming waler, comprising a plate portion of a size adapted to overlie both said outer flanges from beyond the outside edge of one said flange to beyond the outside edge of said other outer flange, hook means at one edge of said plate adapted for securing said plate to the outer edge of one of said flanges, fastening means adapted for use in securing said plate to said other flange, a raised spacer portion formed in the bottom face of said plate and dimensioned to fit snugly in the gap between said channels when said plate is hooked in place on said waler, and a tie rod aperture through said plate substantially centered through said raised portion.

4,350,319
CONTROL FOR AN ELECTROMAGNETIC SOLENOID VALVE

Shoji Kawata, Okazaki; Kyo Hattori, and Kazuhiro Sakurai, both of Susono, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed May 22, 1980, Ser. No. 152,293
Claims priority, application Japan, May 26, 1979, 54/65288
Int. Cl.³ F16K 31/08
U.S. Cl. 251—65 4 Claims

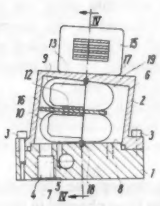


1. A solenoid controlled valve device comprising:
a valve body having fluid inlet port means and fluid outlet port means;
a valve member disposed within said valve body and having
a closed position wherein said fluid outlet ports means is blocked from fluid communication with said fluid inlet port means, and
an open position wherein said fluid outlet port means is in fluid communication with said fluid inlet port means;
solenoid means for electromagnetically controlling the movement of said valve member, said solenoid means including a hollow core disposed in said valve body, a bobbin slidably mounted on the core, a coil disposed about the bobbin, and magnetic means fixed in the valve body for exposing the coil to a substantially perpendicular magnetic field;
and switching means for alternately directing an electric current to said coil in one direction wherein said valve member is moved toward said open position and in the opposite direction wherein said valve member is maintained in said closed position, said switching means being responsive to a switching signal; and
time delay means for switching the direction of said current from said one direction to said opposite direction after a predetermined time delay from application of said switching signal to said switching means.

4,350,320
VALVE, ESPECIALLY A SOLENOID VALVE

Kurt Stähle, Steinegg, Fed. Rep. of Germany, assignor to Concordia Fluidtechnik GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 6, 1979, Ser. No. 100,961
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1978, 2853231
Int. Cl.³ F16K 31/06
U.S. Cl. 251—129 22 Claims



1. Valve for controlling fluid flow through at least one opening in a housing or the like comprising:
a valve chamber defined on opposite sides by a sealing surface means having at least one fluid opening thereon and a matching surface;
movable sealing body means guided in engagement between said matching surface and sealing surface means to selectively close and open said at least one fluid opening in dependence on the position of the sealing body means; and
electromagnetic drive means for changing the position of said sealing body means relative to the sealing surface means;
wherein the movable sealing body means comprises annular loops of sealing material fixedly interconnected at facing circumferential portions, a plate located between said circumferential portions, and magnetic material means carried by said plate for enabling said drive means to electromagnetically act upon said sealing body means to produce unrolling of one of said loops against the sealing surface means.

4,350,321

QUICK COUPLING DEVICE FOR PRESSURIZED FLUID CONDUITS

Lennart G. Berg, Diagnosvägen 4 B, S-141 54 Huddinge, Sweden

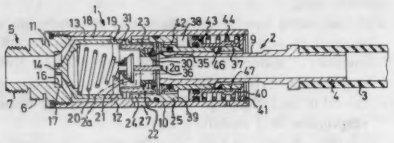
PCT No. PCT/SE80/00037, § 371 Date Oct. 8, 1980, § 102(e) Date Sep. 25, 1980, PCT Pub. No. WO80/01711, PCT Pub. Date Aug. 21, 1980

PCT Filed Feb. 6, 1980, Ser. No. 209,401

Claims priority, application Sweden, Feb. 8, 1979, 7901115

Int. Cl.³ F16L *37/28*

U.S. Cl. 251—149.6 **14 Claims**



1. A quick coupling device for a pressurized fluid conduit, said coupling device comprising a casing part and a nipple part, each part having a flow-through channel and the parts being assembled endwise to define a continuous flow channel; the nipple part having a front portion for being inserted into the casing part and the casing part having an open rear portion for receiving the inserted nipple part;

a flow channel blocking valve in the casing part, the valve including a valve seat supported in the casing part, and the valve seat being movable along the flow channel; a valve element movable along the flow channel and movable from seating on the valve seat, where the valve element and valve seat cooperate to block the flow channel, in a direction off the valve seat and away from the nipple part to open the flow channel, and a spring loading the valve element to seat on the valve seat;

a casing member extending around the valve seat; the casing member being movable along the flow channel and the flow-through channel in the casing part including an internal channel wall of the casing part which is engaged by the casing member for that member to serve as a slide valve on the channel wall;

a first opening through the channel wall and communicating from the fluid conduit into the flow channel in the casing part at the side of the valve that is further away from the nipple part;

a second opening through the channel wall and also communicating into the flow channel in the casing part at the side of the valve further toward the nipple part; the second opening also communicating to the exterior of the casing part, thereby enabling pressure evacuation of the flow channel at that side of the valve that is further toward the nipple part;

the first and second openings being so placed along the channel wall and the casing member being of such length along the channel wall that the casing member may selectively block either one or both of the first and second openings at various positions of the casing member along the channel wall;

the front portion of the nipple part being so shaped and the valve seat and valve element also being respectively so shaped and positioned that, upon insertion of the front part of the nipple part into the casing part, the front part of the nipple part eventually engages both the valve element and the valve seat for moving the valve element off the valve seat and for moving the valve seat along the flow channel between the positions thereof; the nipple part also engaging the casing member upon insertion of the nipple part into the casing part for moving the casing member among its positions along the channel wall.

4,350,322

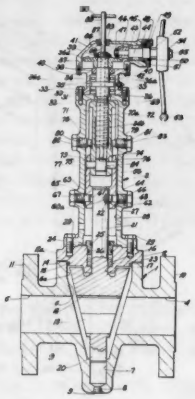
HIGH TORQUE PLUG VALVE ACTUATOR

John H. Mueller, Cincinnati, Ohio, assignor to Grove Truseal Valve Company, Cincinnati, Ohio

Filed Aug. 31, 1981, Ser. No. 297,752

Int. Cl.³ F16K *31/50, 31/52*

U.S. Cl. 251—229 **9 Claims**



1. A high torque actuator for a plug valve of the type having a body with a plug chamber and diametrically opposed inlet and outlet ports communicating with said chamber, a plug in said chamber, having a transverse passage therethrough and an upstanding stem, said plug being shiftable between a first, upper, valve-open position with its transverse passage in alignment with said inlet and outlet ports and a second, lower, valve-closed portion wherein the axis of said transverse plug passage is oriented at 90° to the axes of said inlet and outlet ports, seal means on said plug, said seal means being in engagement with the interior surface of said chamber about said inlet and outlet ports when said plug is in said second, valve closed position, means closing the upper end of said chamber through which said plug stem extends in fluid-tight fashion, said actuator comprising a yoke having a vertical axial bore therethrough, said yoke having a lower end operatively attached to said plug valve with said plug stem extending into said yoke axial bore, said yoke having an upper end, a bearing spool mounted on said yoke upper end, an elongated valve stem being rotatively mounted in said bearing spool and having a lower threaded portion extending into said yoke and being coaxial with said plug stem, a cylindrical coupling located within said axial bore of said yoke and being both rotatable and vertically shiftable therein, said coupling having upper and lower portions and an axial bore therethrough, the upper end of said plug stem being non-rotatively affixed to said lower portion of said coupling, one of said yoke and coupling having a pair of diametrically opposed identical cam slots formed therein, a cam follower for each of said cam slots being supported by the other of said yoke and coupling, an elongated drive cam located within said yoke and extending axially thereof, said drive cam having an axial bore the upper part of which is threaded and threadedly engaged by said lower threaded portion of said valve stem, means to prevent rotation of said drive cam within said yoke axial bore, said drive cam having a lower portion containing a pair of diametrically opposed, identical, sloping drive slots each extending 90° thereabout, said lower portion of said drive cam being received within the axial bore of said upper portion of said coupling, said upper portion of said coupling having a pair of diametrically opposed perforations, a drive pin connecting said lower portion of said drive cam to said upper portion of said coupling, said drive pin extending through said drive cam drive slots with its ends located in said coupling perforations, said

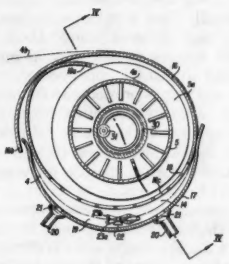
coupling cam slots being so configured that upon turning said valve stem in one direction to cause said drive cam and said coupling to shift downwardly in said yoke, said plug in said valve-open position will be simultaneously partially lowered and turned 90° and thereafter lowered without rotation to said valve-closed position with said plug seals in engagement with said chamber interior surface about said inlet and outlet ports and upon turning said valve stem in the opposite direction, to shift said drive cam and said coupling upwardly in said yoke, said plug will first be lifted vertically without rotation out of sealing relationship with said chamber inlet and outlet ports and thereafter will be simultaneously lifted and rotated 90° to said valve-open position, said drive slots of said drive cam being so configured as to cooperate with said drive pin to increase the torque imparted to said plug during said 90° turn of said plug when shifted between its valve-open and valve-closed positions.

4,350,323

DEVICE FOR RECOVERY OF A CABLE FOR HANDLING A SUBMERGED LOAD

Joël M. Charles, Toulon, and Robert J. Toscano, La Seyne/Mer, both of France, assignors to Etat Francais as represented by the Delegue General pour l'Armement, Armees, France

Filed Aug. 13, 1980, Ser. No. 177,606
Claims priority, application France, Aug. 27, 1979, 79 21424
Int. Cl.³ B66D *1/50*
U.S. Cl. 254—273 **8 Claims**



8. A device for recovery of a cable which a surface ship uses to haul a submerged load, comprising:

a drum for winding and extending said cable,

a variable speed motor for driving said drum at variable speeds,

a loop shaped, cable passageway circumscribing said drum for forming a loop of cable variable length and compensating for the inertia of said drum, and

means for sensing the length of said cable loop and for automatically controlling the speed of said variable speed motor as a function of said loop length so as to maintain the average length of the cable loop at a constant value over time, whereby said cable may be wound around said drum at a desired uniform tension despite irregularities in tension exerted onto said cable as a result of the movements of said surface ship caused by the water surrounding said ship.

4,350,324

METHOD OF REMOVAL OF SLAG DEPOSITS FROM THE BOTTOM OF A FURNACE

Petrus J. A. Kramer, Oudkarspel, Netherlands, assignor to Estel Hoogovens B.V., IJmuiden, Netherlands

Filed Dec. 16, 1980, Ser. No. 217,105
Claims priority, application Netherlands, Dec. 17, 1979, 7909062
Int. Cl.³ B08B *7/04*
U.S. Cl. 266—44 **5 Claims**

1. In a method of removal of slag deposits from the bottom of a furnace wherein a substance capable of lowering the melting point of the slag is supplied to the slag, heat is applied to the slag and the slag is then removed,

the improvement that:

in addition to the same melting point-lowering substance, a substance which performs an exothermic chemical reaction is supplied locally so as to initiate melting of the slag, and the slag is thereafter brought to a condition of fluidity which allows its removal by means of a mechanical grab, and

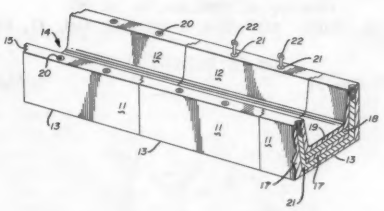
said furnace is a soaking pit of a slabbing mill, operating at about 1300° C.

4,350,325

PREFABRICATED MULTIPLE DENSITY BLAST FURNACE RUNNER

Micheal D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Mar. 18, 1981, Ser. No. 245,087
Int. Cl.³ F27D *3/14*
U.S. Cl. 266—196 **8 Claims**



1. A hot metal runner unit comprising an elongated trough-like body member having a base and spaced parallel upstanding side sections wherein said runner unit is a multi-layered mass of refractory material comprising a mixture of aluminum oxide, raw fire clay and binders consisting of at least one of a group consisting of phosphoric acid, silicon carbide and powdered graphite in which each layer is coalesced by physical force not under thermal influence with each of said multi-layers being of a different density and having a known predetermined lifetime when subjected to molten metal flowing therethrough.

4,350,326

APPARATUS FOR HEAT RECOVERY FROM MOLTEN SLAG

Hiroo Fujii, Kakogawa; Kiyoaki Tanaka, Kobe; Masashi Nakamura, Fujisawa; Ryuzo Okuno, Kobe; Shigeyuki Hashizume; Hideo Katayama, both of Chiba, and Tsutomu Fujita, Chiba, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha and Kawasaki Steel Corporation, both of Hyogo, Japan

Filed Feb. 2, 1981, Ser. No. 230,882
Int. Cl.³ F27D *15/02*
U.S. Cl. 266—201 **16 Claims**

1. Apparatus for the recovery of heat from molten slag comprising:

combination agitating and heat recovery means at a first heat recovery station for agitating molten slag to granulate the slag and for recovering heat therefrom, said means having a slag receptacle means for receiving the molten slag therein, a horizontal rotatable shaft, and a plurality of agitator rods projecting from axially spaced positions on the rotatable shaft and movable into and out of the slag in said slag receptacle means during rotating of said shaft, said rotatable shaft and said agitator rods having passageway means therein and means for passing fluid to be heated through said passageway means for heating the

fluid at least by radiation from the slag being agitated by said agitating and heat recovery means;

conveying means for conveying the granulated slag from the first heat recovery station to a second heat recovery station; and

heat recovery means at the second heat recovery station for heating a gas by convection from the granulated slag.

4,350,327

APPARATUS FOR REMOVING SUCCESSIVE SHEETS FROM A STACK OF OVERLAPPING SHEETS

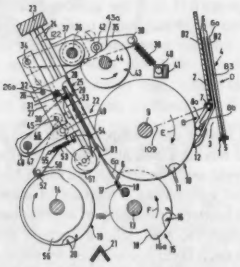
Hans Müller, Zofingen, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed Sep. 30, 1980, Ser. No. 192,353

Claims priority, application Switzerland, Oct. 17, 1979, 9326/79

Int. Cl.³ B65H *39/02*

U.S. Cl. 270—54 **13 Claims**



1. Apparatus for manipulating sheets of the type having two panels, a folded back which is integral with said panels and two front edge points opposite the folded back, comprising a source of neighboring sheets; guide means defining an elongated path for the sheets; means for removing successive sheets from said source and for introducing the removed sheets seriatim into said path so that the folded back of each sheet in said path constitutes the leader of the respective sheet during introduction of the sheet into said path, comprising a rotary transfer conveyor having means for gripping successive sheets during movement of said conveyor from a first to a second angular position during each revolution of said conveyor whereby the folded back of a sheet which is engaged by said gripping means enters into and advances along said path; braking means extending across said path so as to be contacted by the folded back of a sheet which enters said path substantially at the time said conveyor reaches said second angular position and the sheet is released by said gripping means whereby the thus released sheet tends to continue its movement along said path owing to inertia and the folded back of such sheet bears against said braking means; means for withdrawing successive sheets from said path, including means for engaging at least one front edge portion of the sheet in said path and for moving the respective sheet counter to the direction of entry of the sheet into said path; and means for moving said braking means in synchronism with said conveyor so as to decelerate the sheet in said path while such sheet moves in said direction subsequent to disengagement from said gripping means.

4,350,328

SHEET FEEDING APPARATUS

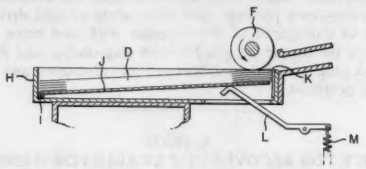
Hiroshi Katakura, and Mitsuru Nagoshi, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1980, Ser. No. 205,711

Claims priority, application Japan, Nov. 15, 1979, 54/148130; Nov. 15, 1979, 54/148131

Int. Cl.³ B65H *3/30*

U.S. Cl. 271—22 **5 Claims**



1. In an apparatus for feeding sheets from a stacked supply thereof,

a tray for supporting a stack of sheets and from which the uppermost sheet of a stack supported thereon is feedable at a leading edge thereof,

a sheet feeding roller operatively rotatable for drawing the uppermost sheet from a sheet stack supported on said tray and positionally fixed with respect to said tray proximate the leading edge of the uppermost sheet,

biasing means for urging said tray in opposition to said feeding roller so that the uppermost sheet of a stack supported on said tray is pressed into frictional contact with said roller, whereby operative rotation of said roller causes the uppermost sheet to be fed from the stack, and

supplemental displacement means on said tray between the tray and sheets stacked thereon for displacing said tray with respect to said feeding roller by an amount greater than that displacement otherwise imparted to the tray by the sheets stacked thereon so as to increase the urgency with which the uppermost sheet is pressed into frictional contact with said roller and thereby facilitate feeding from said tray of sheets having properties that might otherwise interfere with normal feeding from said tray, said supplemental displacement means comprising a member formed of a material of relatively light specific gravity.

4,350,329

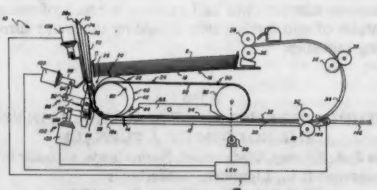
SHEET FEEDING APPARATUS

Ronald C. Holzhauser, Holley; James A. McGlen, and Matthew J. Russel, both of Rochester, all of, NY, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 25, 1980, Ser. No. 172,340

Int. Cl.³ B65H *3/44*

U.S. Cl. 271—9 **9 Claims**



1. In apparatus for feeding document sheets to an exposure position, the apparatus having means for feeding a sheet to the exposure position along a recirculating sheet path or along a non-recirculating sheet path, the feeding means having at least one drive belt for moving a sheet traveling along either sheet

path past the exposure position, the belt being supported for movement along an arcuate path and then along a straight path leading past the exposure position, the improvement comprising:

means defining a generally vertically disposed slot (i) havng a first opening for receiving a sheet to be fed along the non-recirculating path and (ii) having a second opening located adjacent to the arcuate path so that a sheet can pass through the second opening and be delivered to a position adjacent and alongside the arcuate path of the belt;

a roller adjacent the second opening engageable with the belt in the arcuate path of the belt, and

means for urging the roller toward the arcuate path of the belt so that a sheet delivered from the second opening of the slot or fed along the recirculating sheet path is urged against said belt in said arcuate path, the belt being effective to move the sheet from the arcuate path along said straight path to the exposure position.

4,350,330

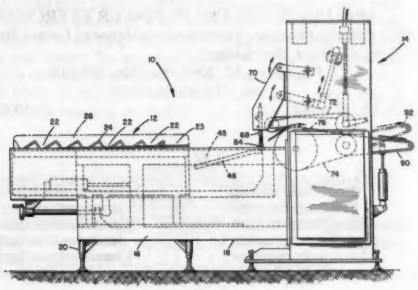
BAG UNIT FEEDER

Charles K. Brown, 8317 Robert Bruce Dr., Richmond, Va. 23235

Filed Jul. 3, 1980, Ser. No. 165,723

Int. Cl.³ B65H *1/04, 1/26, 3/08*

U.S. Cl. 271—12 **15 Claims**



1. A bag unit feeder, comprising:

an accumulating means, said accumulating means being rack-like, said accumulating means supporting an accumulated series of packets of bag units, each packet of bag units being an accumulation of bag units;

an indexing means, said indexing means being affixed to said accumulating means, said indexing means providing a capability of both lifting said series of packets of bag units enmasse and forwardly advancing said series of packets of bag units one step at a time to a new location in said accumulating means;

a receiving cavity means, said receiving cavity means being located adjacent to said accumulating means and at a lower level than said accumulating means, said receiving cavity means receiving the forward-most packet of said bag units each time said indexing means advances said series of packets said one step; and

a dispensing means, said dispensing means being located adjacent to said receiving cavity means, said dispensing means having a capability of dispensing one single bag unit from said packet of bag units in said receiving cavity means.

4,350,331

SHEET COUNTING APPARATUS

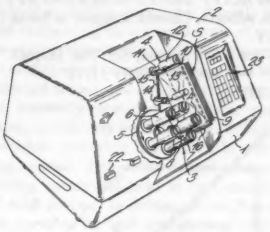
Stanley W. Middleditch, Hayling Island, England, assignor to De La Rue Systems Limited, London, England

Filed Dec. 5, 1979, Ser. No. 100,458

Claims priority, application United Kingdom, Dec. 8, 1978, 47672/78

Int. Cl.³ B65H *3/12*

U.S. Cl. 271—95 **5 Claims**



1. Apparatus for counting flexible banknotes contained in a stack, said apparatus being of a type comprising a first support surface for supporting a stack of banknotes on edge, means for clamping one end of the stack, and a rotary banknote removing assembly mounted on an axis disposed at a right-angle to said support surface, and in which said banknote removing assembly includes a plurality of rotary suction organs which are adapted to contact a side face of the free end of the stack and to deflect each banknote from its initial position and to count it, the deflecting and counting being accomplished through the sequential application of vacuum to each of the organs as the assembly rotates, said apparatus being characterized (a) in that the axis of said rotary banknote removing assembly is disposed at an acute angle with respect to the vertical and in a direction towards a frontal extremity of the apparatus (i.e. towards an operator); (b) in that the banknote clamping means is disposed in such a manner that the free end of a stack of banknotes secured thereby is also directed towards said frontal extremity; (c) by the provision of a second banknote support surface disposed at right angles to said first support surface for supporting said free end of said stack, and (d) that said second support surface is of arcuate configuration as viewed in a direction parallel to said axis.

4,350,332

SHEET HANDLING APPARATUS

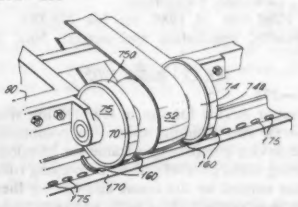
Clifford Knight, Newnham-on-Severn, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1977, Ser. No. 780,946

Claims priority, application United Kingdom, Jun. 25, 1976, 26585/76

Int. Cl.³ B65H *29/20, 29/70*

U.S. Cl. 271—188 **2 Claims**



1. Sheet handling apparatus comprising a drive roller, means for rotating the roller, a pair of stationary curved guide surfaces for urging a sheet in a curved path against the periphery

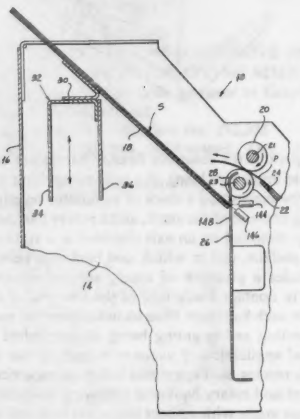
of the roller, the guide surfaces include straight lead in portions generally tangent to curved portions thereof while being spaced from the roller at opposite sides respectively thereof and arranged radially inwardly of the roller periphery such that the sheet is corrugated in the lateral direction in order to increase the beam strength of the sheet and thereby improve the coupling force between the sheet and the roller.

4,350,333

LARGE-CAPACITY SHEET-STACKING APPARATUS

Benzion Landa, Alberta, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Filed Jul. 11, 1980, Ser. No. 167,462
Int. Cl.³ B65H *31/10*
U.S. Cl. 271—217 **7 Claims**



1. Sheet-stacking apparatus including in combination means adapted to support a stack of sheets, means for feeding sheets to said supporting means to form a stack thereon, means for sensing the level of the top of the stack, a lead screw, a follower engaging said lead screw, means coupling said follower to said supporting means, means responsive to said sensing means for driving said lead screw to control the level of said supporting means, a first stop extending radially from said lead screw, and a second stop extending axially from said follower, said second stop being so disposed as to intercept said first stop at a predetermined position of said follower to prevent the further rotation of said lead screw.

4,350,334

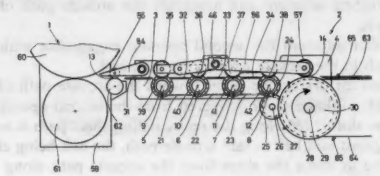
CONVEYOR DEVICE FOR TRANSFERRING SHEETS BETWEEN TWO PRINTING UNITS OF A COMBINED PRINTING MACHINE

Brian M. Quinton, Basingstoke, England, assignor to De La Rue Giori S.A., Lausanne, Switzerland

Filed Nov. 10, 1980, Ser. No. 205,289
Claims priority, application Switzerland, Nov. 30, 1979, 10646/79
Int. Cl.³ B65H *5/02*
U.S. Cl. 271—274 **4 Claims**

1. A conveyor device for use in transferring sheets to be printed between two printing units of a combined printing machine, the device comprising a frame for location between the two printing units, parallel spaced conveying rollers of the same diameter carried by the frame and having their axes of rotation lying in a common plane with their peripheries passing through a tangential plane parallel with said common plane and constituting a plane along which the sheets pass between the outlet of one printing unit and the inlet of the other, means for driving the conveying rollers in synchronism with the conveying speed of a cylinder of one of the printing units, stationary guide plates mounted between the conveying rollers with their surfaces lying in the plane along which the sheets pass, pressure rollers mounted above each conveying roller, and means for resiliently urging the pressure rollers into contact with the conveying rollers at least approximately in the plane along which the sheets are conveyed,

the pressure rollers being mounted on arms pivotable about



shafts arranged parallel to the axes of the conveying rollers and are subjected to the force of springs acting at right angles to the plane along which the sheets are conveyed,

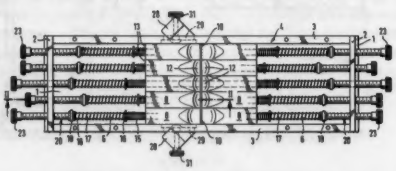
the pressure rollers being arranged side-by-side and cooperating with a respective pair of conveying rollers mounted at the ends of an arm, which at its central region is pivoted by means of a pin to one end of a further arm, and which at its other end is pivotable about a stationary pivot and is subject to the action of one of the springs.

4,350,335

APPLIANCE FOR USE IN FINGER EXERCISES

Max Pasbrig, Orselina, Switzerland, assignor to Lacrex Brevetti S.A., Orselina, Switzerland

Filed Nov. 12, 1980, Ser. No. 206,014
Int. Cl.³ A63B *11/08*
U.S. Cl. 272—67 **10 Claims**



1. An appliance for use in finger exercises, said appliance comprising:

a frame,

a common guide rod fixed in said frame,

at least one pair of axially aligned sliders, which are exposed to one side and axially slidably mounted on said common guide rod in said frame, each of said sliders having confronting faces,

spring means urging said sliders of said pair toward each other, said spring means for each of said sliders including a relatively weak spring having an inner end adjacent to the associated slider and an outer end, and a relatively strong spring having an inner end bearing on said outer end of said weak spring and an outer end adjacent to one of said end walls,

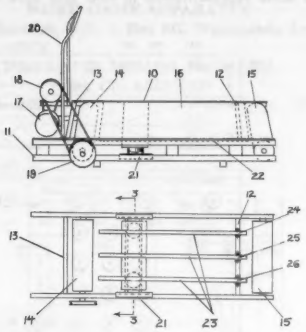
two adjusting screws screwably mounted in respective ones of said end walls and having inner ends operatively connected to said outer ends of respective ones of said strong springs, and

each of said confronting faces being formed with a depression which is open on said exposed side of the slider and adapted to receive a fingertip.

4,350,336
EXERCISE TREADMILL SHOCK-ABSORBING IMPROVEMENT

Norris E. Hanford, P.O. Box 1283, Fort Benton, Mont. 59442

Filed Oct. 14, 1980, Ser. No. 196,458
Int. Cl.³ A63B *23/06*
U.S. Cl. 272—69 3 Claims

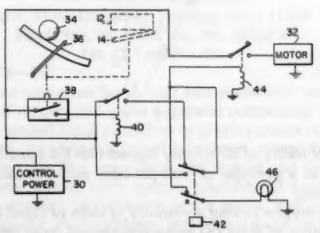


1. An exercise treadmill which comprises:
a longitudinal main frame;
an endless tread-belt mounted on said frame and having an upwardly exposed operative section;
a belt support platform having front and rear ends, said platform underlying said operative section of said belt and being connected proximate its rear end to said frame; and
shock-absorbing platform support means on said frame upon which said platform rests at a location forward of said connection, said support means being movable fore and aft on said frame for adjustment purposes so as to act as a shock-absorbing fulcrum for the platform so as to protect the body of the exerciser from the shock usually associated with running or walking on a hard surface.

4,350,337
ENERGY SAVING ARRANGEMENT FOR BOWLING APPARATUS

Joseph Knauer, Brooklyn, and Howard Moskowitz, Howard Beach, both of N.Y., assignors to Kilo-Wattch-Dog, Inc., Melville, N.Y.

Filed Dec. 26, 1979, Ser. No. 107,412
Int. Cl.³ A63D *5/00*
U.S. Cl. 273—43 A 6 Claims

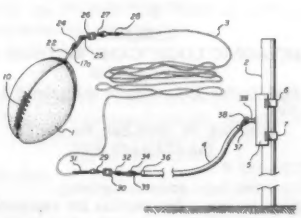


1. An energy saving arrangement for bowling equipment, comprising: switching means actuated by pin setting means during motion thereof; time delay means connected to said switching means and held in an operative state after actuation of said switching means; control circuit means operated by said time delay means and connecting a motor for pin setting to a source of power only during the operative state of said time delay means; said time delay means being set to an inoperative state when said switching means after being actuated is not re-actuated within a predetermined time interval; said motor being continuously connected to said source of power when a bowler plays continuously at a predetermined pace so that said switching means is continuously re-actuated, said time interval being dependent on said pace, said motor being disconnected from said source of power when the bowler discontinues playing for a time length exceeding said time interval whereby said switching means is not re-actuated within said predetermined time interval; manually-operated switching means for connecting, in one state of operation, said motor directly to said source of power, and connecting in a second state of operation said source of power to said control circuit means; capacitor means connected to said control circuit means so that said capacitor means is connected across said motor in the second-mentioned state of said manually operated switching means; second switching means operatively connected to and actuated by ball return means when returning a ball to a bowler or said pin setting means; second time delay means connected to said second switching means and held in an operative state after actuation of said second switching means, second control circuit means operated by said second time delay means and connecting a second motor for the ball return to a source of power only during the operative state of said second time delay means; said second time delay means being set to an inoperative state when said second switching means after being actuated is not reactuated within a predetermined time interval; and second manually operated switching means having a first state for connecting said second control circuit means to said second time delay means, and having a second state for connecting said control circuit means directly to the source of power for said second motor means.

4,350,338
FOOTBALL PRACTICE AID

Randall L. May, 8312 Seaport Dr., Huntington Beach, Calif. 92646

Filed Mar. 17, 1980, Ser. No. 131,385
Int. Cl.³ A63B *67/00*
U.S. Cl. 273—55 B 12 Claims



1. The combination of a football practice aid with a regulation little league, junior high school, collegiate or professional football having four equally spaced grooves defined by seams extending longitudinally thereof, said practice aid comprising
a harness comprising four equally spaced non-elastic cords operatively secured each to another at opposite ends thereof and supported tightly in the grooves of said football and substantially recessed therein,
tether means comprising
a non-elastic cord operatively secured at one end to the portion of said harness where said four cords are secured together and positioned at one end of said football at the longitudinal axis thereof,
means connected to said cord permitting spin or rotation of said football about its longitudinal axis or otherwise without twisting the same,
an elastic supporting member operatively secured at one end to the other end of said non-elastic cord, and

a support member operatively secured to the other end of said elastic member and operable to be supported on a support fixed in the earth, and

said practice aid being operable to permit said football to be passed or punted with a normal spin and to be returned by said elastic member to the player using the same.

4,350,339

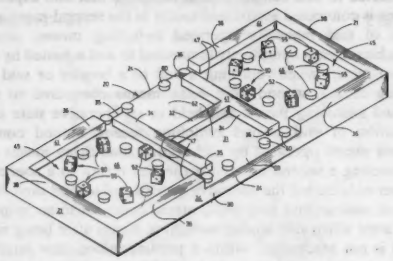
COMBINED DICE AND CARD GAME APPARATUS

Leon A. Imbert, 2313 Venus Dr., Ceres, Calif. 95307

Filed Sep. 29, 1980, Ser. No. 191,390

Int. Cl.³ A63F *1/00, 1/10*

U.S. Cl. 273—148 A **9 Claims**



1. A game apparatus comprising a deck of playing cards of substantially uniform length having indicia individual thereto assigning each card a respective numerical value and means having an upwardly disposed first surface and a plurality of upwardly disposed second surfaces which are substantially coplanar with the first surface and are disposed in spaced relation in a circle, the first surface extending about the second surfaces in spaced relation thereto; said second surfaces being spaced from said first surface less than the length of said cards and being adapted individually to receive a playing card rested thereon and on the first surface in bridging relation to the space therebetween; and each of the second surfaces bearing indicia indicating a numerical value individual thereto for comparison with the numerical value of the card rested thereon.

4,350,340

ELECTRONIC LOGIC GAME METHOD AND APPARATUS

Alfred E. Hall, Dallas, Tex., assignor to Sigalos & Levine, P.C., Dallas, Tex.

Filed Sep. 25, 1980, Ser. No. 190,612

Int. Cl.³ A63F *9/06*

U.S. Cl. 273—153 R **11 Claims**

1. An electronic logic game comprising:

a. a display having a first portion for representation of a balance scale and a second portion for representation of a plurality of units to be symbolically weighed, one of said units differing from the others electronically by one of two states,

b. means for removing selected ones of said units from said second portion of said display to said first portion for display on said scale representation,

c. means associated with said balance scale representation for detecting said different unit when it is visually displayed on said representation of said balance scale, and

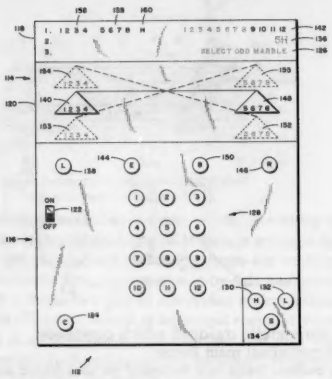
d. circuit weighing means coupled to said detecting means and said balance scale representation for visually representing said scale to be balanced or unbalanced in a predetermined direction according to said state of said different unit whereby said different unit may be logically discovered in a predetermined number of weighings by said electronic scale balance or unbalance representations.

11. A method of solving a logic problem in an electronic logic game comprising the steps of:

a. forming a display having a first area with a visual representation of a scale that may be balanced or unbalanced and a second area with a visual representation of a plurality of playing units,

b. selectively simulating one of said units to be heavier or lighter than the others,

c. transferring a combination of selected ones of said plurality of playing units from said second area of said display to said scale representation in said first area to cause an



indication of balance or imbalance of said scale representation and the direction of imbalance, and

d. observing, and indicating said balance or imbalance when different combinations of said playing units from said second area are placed on said scale representation in said first area three successive times whereby said selected one of said playing units and its heavier or lighter simulated weight may be logically discovered.

4,350,341

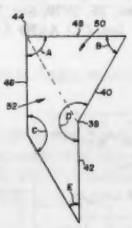
SURFACE COVERING TILES

John Wallace, 359 Nassau St., Princeton, N.J. 08540

Filed Jun. 18, 1981, Ser. No. 274,823

Int. Cl.³ A63F *9/10*

U.S. Cl. 273—157 R **8 Claims**



1. A plurality of identically shaped tiles for covering a plane surface in a periodic or non-periodic manner, each said tile comprising:

(a) a polygon having a plurality of sides of equal length, the number of sides (S) being determined from the equation, $S=2n+1$; where n is an integer greater than 1;

(b) the angle (A) in degrees formed between a reference side and a first side being determined by, $A=120-60/n$;

(c) the angle (B) formed between said reference side and a second side being equal to 60 degrees;

(d) each of the angles (C) in degrees formed between said first side and successive sides being adjacent thereto being determined by, $C=180-60/n$;

(e) the angles (D) in degrees formed between said second side and successive slide being adjacent thereto being determined by, $D=180+60/n$; and

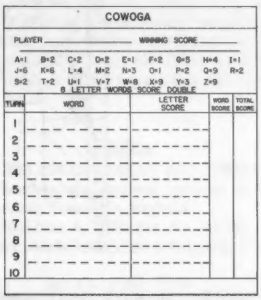
(f) the closing angle (E) in degrees between the last successive first and second sides being given by, $E=60n$.

4,350,342

WORD GAME APPARATUS

Thomas J. Barulich, R.D. 1, Box 8G, Wawayanda Ave., Slate Hill, N.Y. 10973

Filed Apr. 21, 1980, Ser. No. 141,893
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—240 **11 Claims**



1. A word forming game apparatus comprising a first letter supply means and a second letter supply means, each of said first and second letter supply means providing a plurality of letter selections, each letter selection being greater in number than a full complement of the letters of the alphabet, said first letter supply means having a letter distribution different from that of said second letter supply means, and said first and second letter supply means being adapted to be utilized serially and apart from each other for the respective selection of a first and a second random letter to be used in a word forming capacity, together with a letter selected directly from said alphabet sequentially intermediate thereto, said randomly selected letters and said directly selected letters all having assigned thereto certain numerical point values for scoring purposes, and means to permit the orderly and contiguous recordation of the letters selected, the words formed, and the point scores achieved thereby.

4,350,343

SOCCER BOARD GAME

Jorge Salazar, 41-40 Union St., Flushing, N.Y. 11355

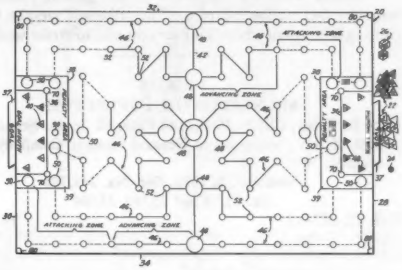
Filed Nov. 28, 1980, Ser. No. 211,185
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—247 **5 Claims**

1. A game apparatus for at least two players for simulating the game of soccer, said game apparatus comprising:

first and second equal pluralities of playing pieces representing first and second teams of soccermen, means for distinguishing the first team from the second and for distinguishing, among each team, a plurality of forwards, a lesser plurality of defenders, and a goalie, and means for individually distinguishing the forwards of each team from each other; a game board having indicia delineating (a) first and second goal areas at opposite ends of said board, each goal area having indicia therein corresponding to the means for distinguishing said forwards from each other, and (b) first and second pluralities of player movement paths, there being one path for each forward on each team, each path comprising a plurality of spaces representing positions for said soccermen, each path including a first group of consecutive spaces defining an advancing zone and a second group of consecutive spaces defining an attacking zone, the final space of the attacking zone of each of said first plurality of paths terminating near one goal area and the final space of the attacking zone of each of said second plurality of paths terminating near the other goal area, said defenders being positionable on the spaces in the paths occupied by the opposing team's forwards for blocking the movement of said forwards therealong;

a piece representing a soccerball, said soccerball being movable with said forwards toward said goal areas;

chance means manipulatable by said players, said chance means having indicia thereon corresponding to said means for distinguishing said forwards and to said indicia in said



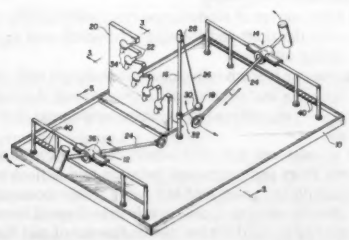
goal areas, said chance means being manipulatable by one player for passing said ball from one of said one player's forwards to said one player's forward having distinguishing means corresponding to the indicia indicated on said chance means, and for moving said ball into said goal area when the forward associated with the ball is on a predetermined space in its corresponding player movement path and the indicia indicated on said chance means corresponds to an unoccupied indicia in said goal area, said chance means being manipulatable by said other player for interrupting movement of said ball by said one player when said indicia indicated on said chance means corresponds to the distinguishing means of said one player's forward associated with the ball.

4,350,344

APPARATUS FOR PLAYING A COMPETITIVE GAME

Michael L. Bear, 1900 Pidgeon Point Rd., Beaufort, S.C. 29902

Filed Feb. 19, 1981, Ser. No. 235,783
Int. Cl.³ A63B *67/10*
U.S. Cl. 273—333 **42 Claims**



24. Apparatus for playing a competitive game, said apparatus comprising:

(a) a playing board having a first player's station at one end and a second player's station at the opposite end;

(b) an upright standard mounted on said playing board intermediate said ends;

(c) a weight;
(d) first means for rotatably mounting said weight on said upright standard at a point remote from said playing board;
(e) a target holder mounted on said playing board intermediate said ends;
(f) at least one target mounted on said target holder in position to be struck by said weight;
(g) a mallet mounted at each of said player's stations, each of said mallets mounted for pivotal and longitudinal motion relative to the associated one of said player's stations;
(h) a serving platform; and
(i) second means for supporting said serving platform in position so that said weight can be struck by one of said mallets while it is supported by said serving platform,

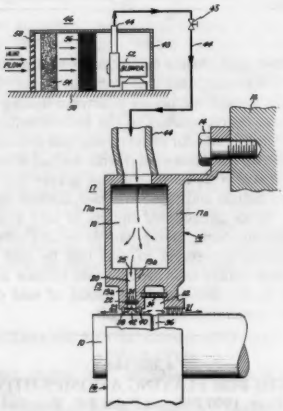
whereby said mallets can be used to strike said weight, thereby causing it to rotate about said upright and to strike said target.

4,350,345

AIR-SEALED OIL DEFLECTOR

Gary L. Kalan, Clifton Park, and Peter G. Ipsen, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1981, Ser. No. 249,781
Int. Cl.³ F16J *15/40, 15/44*
U.S. Cl. 277—3 **11 Claims**



1. To prevent leakage of lubricating oil from bearings of a rotating shaft and to prevent the in-flow of unfiltered atmospheric air to the bearing lubricating oil system, an air-sealed oil deflector comprising:

at least one set of oil deflector rings substantially concentric with the shaft and forming a labyrinth seal against lubricating oil flow;

an annular plenum substantially concentric with said deflector rings and disposed radially outward thereof, said plenum being adapted to receive a continuous flow of forced air;

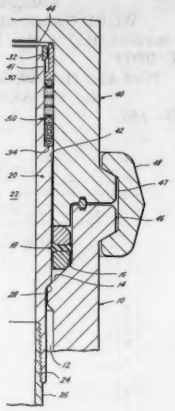
an annular feed slot substantially concentric with said deflector rings and interposed between said deflector rings and said plenum, said feed slot being fluidly connected to said plenum to receive said continuous flow of forced air uniformly along the outer circumference of said feed slot and fluidly connected to discharge said continuous flow of forced air uniformly along the inner circumference thereof to pass radially inward toward the shaft between at least two rings of said deflector rings so that said continuous flow of air is released between the shaft and said at least two deflector rings to produce a uniformly distributed circumferential air seal.

4,350,346

HEAT RESISTANT SEAL

John H. Fowler, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Mar. 27, 1981, Ser. No. 248,507
Int. Cl.³ F16J *15/12*
U.S. Cl. 277—26 **35 Claims**



1. An assembly for maintaining a seal between a first member and a second member housed within the first member, the seal being maintained at both a low temperature and upon the application of extreme heat to the exterior of the first member, comprising:

nonmetal seal means for sealingly engaging the first and second member, said nonmetal seal means having a thermal expansion at least as great as that of the first member;

metal seal means disposed above and below said nonmetal seal means for sealingly engaging the first and second members; and

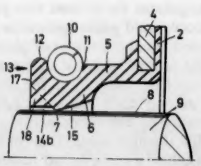
load maintaining means for maintaining a compressive load on said nonmetal means within a predetermined load range.

4,350,347

RADIAL-SHAFT SEALING RINGS WITH HEAT DISSIPATION SEGMENTS

Richard Heinrich, Heilbronn, Fed. Rep. of Germany, assignor to Kaco GmbH & Co., Heilbronn, Fed. Rep. of Germany

Filed Jan. 23, 1980, Ser. No. 114,711
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1979, 2902531
Int. Cl.³ F16J *15/32, 15/54*
U.S. Cl. 277—153 **11 Claims**



1. A radial-shaft sealing ring for a medium being sealed, which comprises in combination: a sleeve-like sealing body having a radial inner periphery and at least one sealing lip with at least one sealing edge subject to radial preloading by a spring in a groove and frictional heat that causes premature wear thereof, said sealing body having two axial ends, one of

which is in the form of an end face which has a first radially inner segment, said at least one sealing lip and said at least one sealing edge being arranged on part of said radial inner periphery of said sealing body between said two axial ends, with said radially inner segment of said end face adjoining said sealing edge, with at least said end face toward the medium being sealed, at least one said radially inner segment thereof, being at least partially unevenly shaped including depressions rather than only edge projections, said depressions extending in axial direction with depth thereof decreasing from the end face side as well as the segment in a direction toward the sealing edge so that heat is removed and dissipated quickly along the shortest path to surrounding medium, said depressions being provided also with the segments having a relatively great radius of curvature so that the segments extend as far as to the groove with the spring therein, said depressions being provided for greatly enlarged inner surfacing thereof particularly to facilitate heat dissipation more uniformly from said sealing lip with said sealing edge thereof to prevent excessive heating of the sealing ring having a long life expectancy and duration of use therewith.

4,350,348

SEALING OF TELESCOPICALLY RELATED ELEMENTS

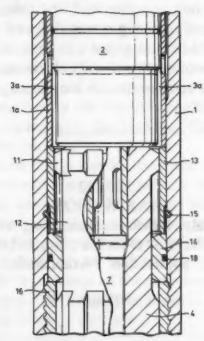
Nigel B. Cox, Southowram, England, assignor to Halifax Tool Company Limited, Yorkshire, England

Filed Nov. 8, 1979, Ser. No. 92,269

Claims priority, application United Kingdom, Nov. 10, 1978, 44129/78

Int. Cl.³ F16J *15/16*

U.S. Cl. 277—199 **9 Claims**



1. Sealing means for telescopically related elements comprising an inner element and an outer element encircling at least part of said inner element, one said element having a cylindrical sealing surface in the region of said encirclement; a sealing ring diametrically divided into two semi-circular parts, said sealing ring being dimensioned to run sealingly and circumferentially uninterruptedly on said sealing surface; means for sealingly securing said sealing ring against axial movement on the other said element; and abutment means on said one element for engagement by said sealing ring to limit movement thereof on said sealing surface, thereby to limit relative motion of the elements.

4,350,349

ROD PACKING

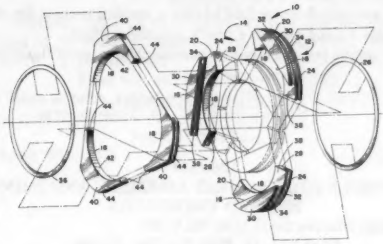
James C. McTavish, Santa Barbara, Calif., assignor to Harry A. Robertson, Jr., Georgetown, Colo.

Filed Feb. 12, 1981, Ser. No. 233,938

Int. Cl.³ F16J *15/24*

U.S. Cl. 277—199 **10 Claims**

1. The rod packing which comprises: at least three flat-faced arcuate segments shaped to define a first ring with a first circular opening in the center thereof when assembled in spaced end-to-end relation, each of said segments having the same one face thereof provided with a projecting portion defining an inwardly-facing shoulder extending chordally so as to intersect the periphery thereof at points spaced inwardly of its opposite ends; a corresponding set of flat-faced wedge-shaped elements insertable between adjacent shoulders cooperating therewith when the arcuate segments lie in ring-forming relation to bridge the gaps between the ends thereof and form a second ring in face-to-face vapor-tight sealed relation alongside the first, said wedge-shaped elements in spaced end-to-end ring-



forming relation also cooperating to define a second circular opening coaxial with the first and of substantially the same size; and tension means encircling one of said first and second rings operative to urge the segments closer together and hold the inside surfaces thereof bordering the central opening therein into vapor-tight sealed contact with a first cylindrical workpiece housed therein, and said adjacent projections responding to the same segment-closing bias by operatively wedging the wedge-shaped element therebetween into vapor-tight sealed engagement against a second cylindrical surface of the workpiece adjacent the first.

4,350,350

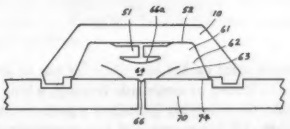
SELF-COMPENSATION GASKET FOR GROOVED END PIPE COUPLINGS

James Blakeley, Thornhill, Canada, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 28, 1980, Ser. No. 143,980

Int. Cl.³ F16L *21/06*; F16J *15/06*

U.S. Cl. 277—207 A **7 Claims**



1. An extruded strip of resilient gasket material for forming of annular gaskets of the type designed for enclosure in a coupling housing in coupling of groove end pipe, said strip having a cross section which comprises:

two base portions,

two side portions, each having an outside and an inside face,

two compression pads, two resilient arms, each having a top, a bottom and an end face, said arms connected one to each of said respective base portions and extending therebetween,

a tongue portion having a top and a bottom face,

two lip portions, each having a top and a bottom face,

said side portions extending downward each from a respective one of said base portions,

each compression pad extending upward from a respective one of said base portions,

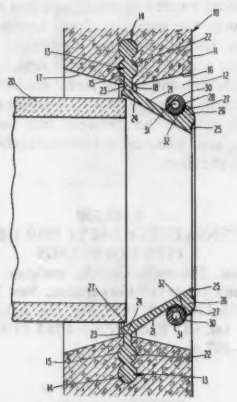
said tongue portion extending between said base portions below said resilient arms,
said tongue portion having a curved shape such that its middle portion is lower than its end portions,
each lip portion extending inward from a respective one of said side portions,
said top face of said tongue portion and said bottom faces of said resilient arms defining a compensation well,
said bottom face of said tongue portion, said top face of each lip portion and the inside face of the respective said portion respectively defining two cavities,
said lips' bottom faces having a smooth texture for efficient sealing against a pipes' external surface,
said tongue's bottom face having a smooth texture for efficient sealing against a pipe's external surface,
said tongue portion having a substantial degree of flexibility.

4,350,351

MANHOLE JOINT GASKET ASSEMBLY AND JOINT FORMED THEREWITH

A. Eugene Martin, Terre Hill, Pa. 17581

Filed Dec. 17, 1980, Ser. No. 217,549
Int. Cl.³ F16J *15/10, 15/46*
U.S. Cl. 277—207 A **15 Claims**



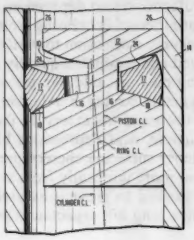
1. A manhole joint gasket assembly for use in joints where pipe is sealingly joined to a manhole through a hole in the wall of the manhole, the assembly including a gasket constructed of rubber-like material and comprising an outer generally radially disposed flange portion of generally ring-like shape for engagement with a manhole wall, and an inner longitudinally extensive sleeve portion; said sleeve portion being joined at its one end to said flange portion and having a free opposite end remote from said flange portion; with the inner periphery of the opposite end of said sleeve portion being of a smaller dimension than the inner periphery of the said one end of said sleeve portion; with at least said sleeve portion being resiliently stretchable at its said opposite end for receiving a pipe therein of larger periphery than the inner periphery of the said opposite end of said sleeve, and wherein said opposite end of said sleeve is provided with a thickened bead portion around its periphery, substantially thicker than the wall thickness of an adjacent said sleeve portion, and including a separate resiliently stretchable ring constructed of rubber-like material disposed about said sleeve portion adjacent to said bead portion.

4,350,352

PISTON RING AND GROOVE ASSEMBLIES

Oldrich S. Kolarik, Hagerstown, Md., assignor to Mack Trucks, Inc., Allentown, Pa.

Filed Jul. 24, 1981, Ser. No. 286,555
Int. Cl.³ F16J *9/20*
U.S. Cl. 277—216 **11 Claims**



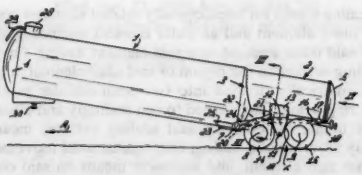
1. A piston ring and groove assembly for forming a seal during piston tilt or eccentricity within a cylinder, comprising:
(a) a piston;
(b) a piston ring groove around a peripheral surface of said piston, said groove having a spherically-convex lower wall with a radius of curvature;
(c) a piston ring in said groove for forming a seal with said cylinder and said groove, said ring having a first side facing said spherically-convex lower wall of said groove and a second side opposite said first side; and,
(d) said first side of said ring contacting said spherically-convex lower wall of said groove to form a seal around the circumference of said groove at all times, even when said piston is tilted or eccentric in a cylinder.

4,350,353

TANK WAGON

Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed May 6, 1980, Ser. No. 147,065
Claims priority, application Netherlands, May 8, 1979, 7903572
Int. Cl.³ B60P *3/22*
U.S. Cl. 280—5 C **19 Claims**

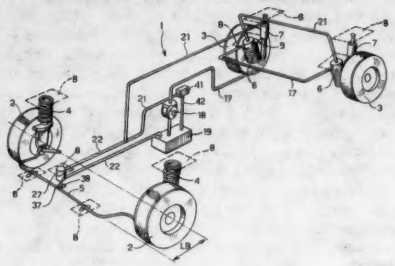


1. A tank wagon comprising a frame and a tank for transporting liquid material, said frame being supported by a rear wheel set, said tank having a longitudinal axis that extends in the direction of wagon travel and said axis being inclined upwardly in a forward direction, with reference to the normal direction of travel, a lowermost tank point being located in front of said wheel set and below the top of the wheels, tank outlet means being located adjacent said lowermost point, said tank comprising two substantially cylindrical tank compartments of different diameters that enclose an uninterrupted space, the smaller diameter compartment being located directly above said wheel set.

4,350,354
SELF-LEVELLING SUSPENSION SYSTEM FOR MOTOR-VEHICLES

Giulio Dotti, Milan, and Renzo Masoero, Turin, both of Italy, assignors to Centro Ricerche Fiat S.p.A., Turin, Italy

Filed Dec. 10, 1980, Ser. No. 214,908
Claims priority, application Italy, Jan. 7, 1980, 67012 A/80
Int. Cl.³ B60G *17/00*
U.S. Cl. 280—6 H **10 Claims**



1. Suspension system for motor vehicles, of the type comprising:

means for sensing subsidence of the front suspensions of the motor vehicle,

means for sensing subsidence of the rear suspensions of the motor vehicle,

actuator means to vary the level of the suspended masses in correspondence with the rear axle of the motor vehicle, and

control means, controlled by the said sensor means, designed to cause the operation of the said actuator means in order to maintain automatically the horizontal attitude of the motor vehicle upon variation in the loads on the front suspensions and on the rear suspensions, wherein

(a) the said system comprises at least one hydraulic cylinder interposed between the springs of the rear suspension and the suspended masses of the motor vehicle, designed to function at the same time as actuator member and as the member for sensing the subsidence of the rear suspensions, the said hydraulic cylinder comprising two members, fixed respectively to the springs of the rear suspensions and to the suspended masses of the motor vehicle, which define between them an internal chamber,

(b) the said system further comprises a tank and a hydraulic pump the inlet to which is connected to the tank and the outlet from which is connected to a first input of the said hydraulic cylinder through a first pipe, and to a second input of the said hydraulic cylinder through a second pipe,

(c) the means for sensing the subsidence of the front suspensions comprise a control valve for controlling the pressure existing in the said second pipe, the said control valve comprising a movable control member designed to move as a function of the subsidence of the front suspensions in order to cause an increase in the pressure in the second pipe as the subsidence of the front suspensions increase.

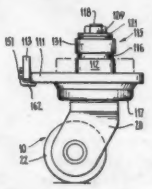
(d) the control means comprise a distribution valve incorporated in one of the two members forming the hydraulic cylinder and including a slide valve subject at one of its ends to the pressure transmitted through the said second input and at its opposite end to the pressure existing in the internal chamber of the hydraulic cylinder; the said slide valve being movable between a first end position, corresponding pressure being transmitted through the said second input, in which the internal cavity of the hydraulic cylinder is connected to exhaust, so as to cause retraction of the hydraulic cylinder, and a second end position, corresponding to there being pressure in the internal chamber of the hydraulic cylinder, in which the said internal chamber is put in communication with the said first input, so as to cause extension of the hydraulic cylinder,

(e) the control means further comprise a spring, acting as the member for sensing the variation in the length of the hydraulic cylinder, interposed between the slide valve associated with one of the two members forming the hydraulic cylinder and the other member of the hydraulic cylinder, the said spring being designed to bring the slide valve back into one of its positions of equilibrium in which the internal chamber of the hydraulic cylinder is isolated, when the vehicle becomes situated in horizontal attitude.

4,350,355
WHEEL MEANS FOR CONTAINER HANDLING

Garnet M. U. Hannan, Bettina Lodge, Jerilderie St., Jerilderie, N.S.W., 2716, Australia

Filed Sep. 20, 1979, Ser. No. 77,168
Claims priority, application Australia, Oct. 5, 1978, PD6246; Apr. 6, 1979, PD8344; Jun. 15, 1979, PD9277
Int. Cl.³ B60B *33/00*
U.S. Cl. 280—28.5 **13 Claims**



1. Apparatus for mounting in a corner aperture of a container, comprising:

a base plate;

a ground engaging means coupled to the underside of the base plate; and

means for locating and locking the base plate with the corner aperture of the container, said means for locating and locking the base plate including:

a locating plate mounted for rotation relative to the base plate and positioned in the corner aperture; and

a locking plate mounted in fixed relationship to the base plate so that when the base plate is rotated relative to the corner aperture, the locking plate is also rotated relative thereto to retain its fixed relationship to the base plate and to secure the base plate to the corner aperture, whereas the locating plate is retained positioned in the corner aperture.

4,350,356
CART

William R. Crothers, 424 W. Springfield Rd., Springfield, Pa. 19064

Division of Ser. No. 939,398, Sep. 5, 1978, Pat. No. 4,222,585. This application Jun. 2, 1980, Ser. No. 155,392
Int. Cl.³ B62B *11/00*
U.S. Cl. 280—47.26 **2 Claims**

1. A cart comprising:

a scoop-shaped body having an open front, a bottom wall, a rear wall and side walls extending upwardly from said bottom wall, wherein at least said bottom wall comprises a flexible sheet material;

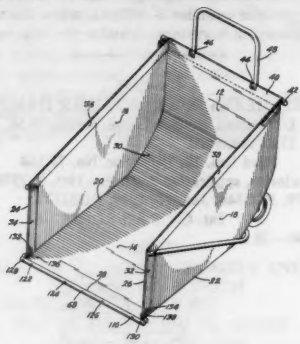
a pair of wheels rotatable on an axle located adjacent the intersection of said rear wall and said bottom wall;

frame means comprising two separate, substantially rigid frame members extending substantially from the front edge of said bottom wall to said axle;

laterally extending means fixed to the forward ends of both of said frame members; and

a substantially rigid clamping member extending along the

front edge of said bottom wall substantially from one side wall to the other and forward of said laterally extending means, said clamping member being secured to the laterally extending means on both of said frame members and securing the forward ends of said frame members in fixed relationship to each other, and said front edge of said bottom wall being clamped between said clamping member and said laterally extending means;



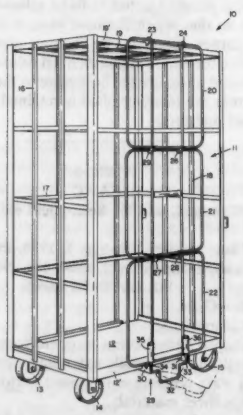
in which said laterally extending means extend laterally outwardly from their frame members, in which the frame members extend underneath the bottom wall of the body, and in which the width of the body is substantially greater than the greatest laterally measured distance between said frame members.

4,350,357

SHIPPING AND DISPLAY CART

Dennis W. Zenner, and Jesse F. Jenkins, both of San Antonio, Tex., assignors to Stinson Manufacturing Company, San Antonio, Tex.

Filed Nov. 21, 1980, Ser. No. 208,879
Int. Cl.³ B62D *53/06*
U.S. Cl. 280—79.3 **1 Claim**



1. An enclosed wheeled, shipping and display cart, comprising:

a wheeled cart having an enclosure for retaining articles being shipped thereon;

said enclosure having at least one side opening with a vertical closure member for selectively positioning in the opening to retain articles within the enclosure;

said vertical closure member including at least three rigid sections hingedly connected with each other and connected with the top of the enclosure for folding substantially flat upon each other and flat against the top of the enclosure out of the way for loading, displaying and transporting the cart;

said rigid sections being substantially equal in size and not greater in size than the top of the enclosure;

said rigid sections being connected by offset hinges so they can fold upon each other; and

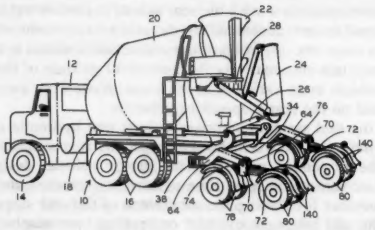
latch means for latching the gate member in place in the opening to retain articles in the enclosure, said latch means including a foot engaging member, spring means, spring retaining members for resiliently securing said foot engaging member to the lowermost end of said rigid sections, and horizontally disposed catches secured to said foot engaging member, each catch having at least two serrated notches for engaging the lower edge of said enclosure, wherein said latch means is extendably connected with the lowermost end of the rigid sections to allow the rigid sections to move outwardly from the enclosure to accomodate articles in the enclosure extending outwardly therefrom.

4,350,358

AUXILIARY LOAD-CARRYING APPARATUS

Tom E. Ferris, 4010 Wyne, Houston, Tex. 77017

Filed May 8, 1978, Ser. No. 903,861
Int. Cl.³ B60P *1/00*
U.S. Cl. 280—81 R **9 Claims**



1. A process for providing supplementary load-carrying support for a load-carrying vehicle comprising the steps of: imposing through a compound angle support which provides for both vertical raising and lowering of the wheels and castering thereof, a relatively constant force upon support wheels, and resiliently constraining each of said wheels individually through a torsion means which provides flexure of the tire and tire support in a lateral sense.

4,350,359

SIDE CAR ATTACHMENT FOR A MOTORCYCLE

James J. Van Gompel, Rte. 1, Box 215A, Fremont, Ind. 46737

Filed Aug. 7, 1980, Ser. No. 176,026
Int. Cl.³ B62K *27/12*
U.S. Cl. 280—203 **16 Claims**

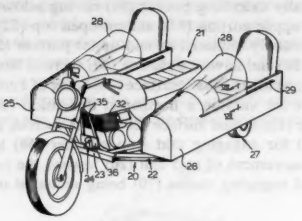
1. A side car attachment for a motorcycle, said attachment comprising:

(a) a frame having a leading end for extending horizontally between the wheels of the motorcycle in front of the motorcycle frame;

(b) wheel means carried by said frame for supporting it; and

(c) a hitch coupling having a first portion secured to said leading end and extending upwardly therefrom, and a second portion detachably securable to said first portion and adapted to be secured to the motorcycle frame in

front of of its engine at a substantially laterally centered position, said hitch coupling enabling pivoting of the



motorcycle relative to said frame about both a horizontal longitudinal axis and a vertical axis.

4,350,360

ASSEMBLY OF PREFABRICATED BICYCLE COMPONENTS

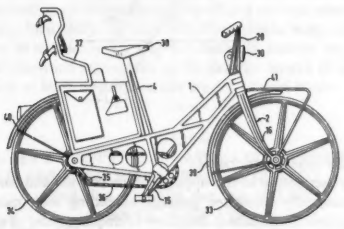
Jan G. Olsson, Sjögangen 6, 421 71 Via Frölunda, and Lars E. Samuelsson, Hedängen 5, 43370 Partille, both of Sweden

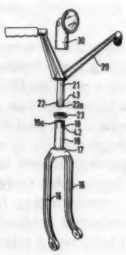
Filed Mar. 11, 1980, Ser. No. 129,263

Claims priority, application Sweden, Mar. 12, 1979, 7902201

Int. Cl.³ B62K *21/06*

U.S. Cl. 280—279 **3 Claims**





1. Assembly of prefabricated bicycle components comprising a frame member component having a sleeve-shaped steering hub, a front fork component provided with a sleeve portion, upper and lower thrust stops formed on said sleeve portion engaging the upper and lower ends respectively of the steering hub, the upper thrust stop being formed by outwardly pointing spring pawls adapted to cam into the corresponding end portion of the steering hub by snap action when the sleeve portion is being inserted into the steering hub, and the lower thrust stop comprising a lower thrust shoulder on said sleeve portion, a handle bar component provided with a sleeve shank, said sleeve shank having an outer diameter which substantially corresponds to the inner diameter of said sleeve portion of said front fork component, said sleeve shank having spring pawls in its lower portion and a shoulder in its upper portion which cooperate with lower and upper counter-stops respectively of said sleeve portion of said front fork component.

4,350,361

LOAD CARRYING PLATFORM FOR A BICYCLE

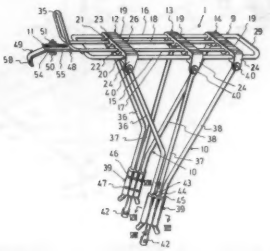
Chiaki Fujii, 6-1 Nishikikui-cho, Nishi-ku, Nagoya-shi, Aichi-ken, Japan

Filed Sep. 9, 1980, Ser. No. 185,636

Claims priority, application Japan, Dec. 6, 1979, 54-158433

Int. Cl.³ B62J *7/04*

U.S. Cl. 280—289 A **4 Claims**



1. A load carrying platform for a bicycle comprising:

(i) a platform body to support a load placed thereon,

(ii) a pair of leg members for supporting said platform body, said leg members having an upper end connected to said platform body and a lower end for connection to a bicycle frame,

(iii) a mounting member having a first end connected to said platform body and a second end for connecting to said bicycle frame,

said platform body comprising a plurality of transverse members which are elongated transversely of the platform and are spaced parallel to each other longitudinally of the platform and which have engaged therethrough a pair of rod-like outer frame members and a plurality of rod-like inner frame members, each transverse member having an upper load bearing surface and including longitudinally-disposed holes at each end receiving said outer frame members and a plurality of longitudinally-disposed holes in a central portion thereof receiving said inner frame members, said holes being disposed at a level below that of said bearing surface, each outer frame member and inner frame member being secured in position in its hole by a portion of the transverse member deformed towards the outer or inner frame member respectively, said transverse members further including at each end thereof a connecting place to which a respective one of said leg members is secured, said outer frame members being respective straight parallel arms of an outer frame and having respective inturned forward ends aligned with each other, said inner frame members being respective straight parallel arms of an inner frame connected by a forward upwardly-inclined curved portion to serve as a rope fastener.

4,350,362

SELF-CENTERING TRAILER HITCH

Donald F. Landers, Grosse Pointe, Mich., assignor to PSI Mobile Products, Inc., Mount Clemens, Mich.

Filed Sep. 29, 1980, Ser. No. 192,179

Int. Cl.³ B60D *7/00*

U.S. Cl. 280—478 A **6 Claims**

6. A trailer hitch comprising, in combination:

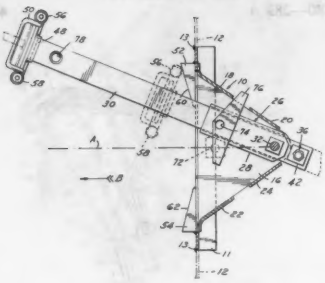
a housing intended to be mounted on a towing or towed vehicle and having a pair of vertically spaced upper and lower plates,

a guide tube pivotally supported between the plates for laterally swingable movement,

a tongue telescoped into the guide tube and supported thereby for swingable movement therewith and extension and retraction relative thereto and having a projecting end disposed beyond the housing for coupling with another vehicle,

a pair of cam wedges on the housing on opposite sides of the projecting end of the tongue having inclined surfaces facing toward the tongue,

cam followers on the tongue for cooperating with said inclined surfaces,



aligned apertures in said upper and lower plates,

transverse apertures in the tube alignable with the plate apertures when the tube is centered in the housing,

a transverse aperture through the tongue alignable with the tube and plate apertures when the tongue is retracted into the tube,

pin means for projection down through said apertures when the same are aligned, and

a pin stop plate on the tube extending transversely thereof for an arcuate distance sufficient to support the pin against interference with swinging movement of the tube except when the tube is centered on the housing.

4,350,363

SCRAPER BAIL STOP ASSEMBLY

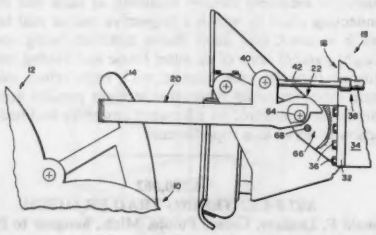
Bennett N. Waddell, Minooka; Larry G. Warren, and Eugene M. Wilson, both of Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00055, § 371 Date Jan. 21, 1980, § 102(e) Date Jan. 21, 1980

PCT Filed Jan. 21, 1980, Ser. No. 136,622

Int. Cl.³ B60D *1/004*

U.S. Cl. 280—481 **5 Claims**



1. In a vehicle (18) having a bail (20) pivotally mounted thereto, said bail (20) being movable from a lowered position toward a raised position, the improvement comprising:

a bifurcated bracket structure (28) mounted on said vehicle (18) and defining a vertically extending pocket (50) having a stop member (68) mounted therein, said bail (20) being pivotally mounted in said bracket structure (28), said bracket structure (28) being adapted to provide a shielded stop for said bail (20);

said vertically extending pocket (50) having a lower portion (56), an upper portion (54), and an open top (52), said bail being pivotally mounted in said upper portion (54) of said pocket (50) and having a surface (80) thereon being pivotal in said open top (52), said surface (80) being of a construction sufficient for varying a horizontal dimension (Δr) of said open top (52) as said surface (80) pivots therein; and

means (70) for engaging said stop member (68) to prevent further movement of said bail (20) toward the raised position, said engaging means (70) being mounted on the bail (20).

4,350,364

SKI BRAKE

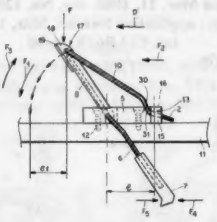
Georges P. J. Salomon, Annecy, France, assignor to Ets Francois Salomon & Fils, Annecy, France

Filed Mar. 18, 1980, Ser. No. 131,376

Claims priority, application France, Mar. 19, 1979, 79 07702

Int. Cl.³ A63C *7/10*

U.S. Cl. 280—605 **25 Claims**



1. A ski brake comprising:

a support securable to the upper surface of a ski and forming a longitudinally elongated passage extending and opening in the normal longitudinal direction of displacement of said ski;

a brake element pivotal on said support about an element axis between a skiing position generally parallel to said ski and lying wholly above the lower surface thereof and a braking position extending downwardly past and transverse to said lower surface; and

a wire biasing loop connected between said brake element and said support and urging said element into said braking position, said loop having a pivot section pivoted in said support for pivoting about a loop pivot axis generally parallel to said surfaces and perpendicular to said direction and another leg extending mainly longitudinally in said normal longitudinal direction of displacement of said ski through said passage and longitudinally displaceable therein between a forwardly advanced position corresponding to said braking position and a rearwardly retracted position corresponding to said skiing position, said loop being relatively greatly elastically deformed and lying generally in a plane parallel to said surfaces in said skiing position of said element and being less elastically deformed and standing up from said upper surface in said braking position of said element.

4,350,365

SKI BRAKING DEVICE

Walter J. DeVigili, Roseville, and Louis E. Hough, St. Clair Shores, both of Mich., assignors to Emprie Automotive, Inc., Roseville, Mich.

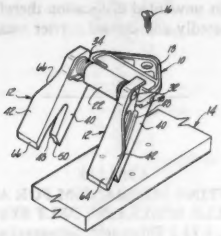
Filed Oct. 10, 1980, Ser. No. 195,879

Int. Cl.³ A63C *9/10*

U.S. Cl. 280—605 **14 Claims**

1. A braking device for preventing rearward movement of a

snow ski, such as when climbing a hill, comprising a plate adapted to be fixedly mounted on the upper face of a ski at generally the mid section thereof, a pair of laterally spaced brake members pivotally mounted on said plate so as to straddle the ski on which the plate is secured and pivot about a horizontal axis extending transversely of the ski, means biasing said brake members to pivot in a downward direction against the surface on which the ski is supported, each brake member comprising an upper paddle and a lower blade extending rearwardly from the pivot axis of the brake member in vertically



spaced relation, said blade lying in a vertical plane and being relatively thin so as to readily penetrate into the surface on which the ski is supported and produce a minimum of drag to the forwardly moving ski, said paddle lying in a plane perpendicular to the blade and being relatively wide so as to restrict the penetration of the blade into the skiing surface when the ski is moving forwardly, the rear end of said blade being relatively sharp so as to readily dig into the skiing surface in response to a slight rearward movement of the ski, the length of said paddle being at least as great as the length of said blade.

4,350,366

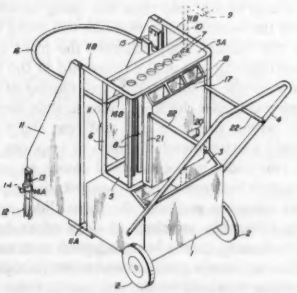
MANUALLY PROPELLED LAWN AND GARDEN CART

Harold R. Helms, 965 Rile St., Bushnell, Ill. 61422

Filed Nov. 17, 1980, Ser. No. 207,352

Int. Cl.³ B26B *1/04*

U.S. Cl. 280—655 **3 Claims**



1. A manually propelled lawn and garden cart comprised of a bottom storage box having oblique openings on either side near the top of the bottom storage box, an open frame secured to the top of the bottom storage box, a cross piece attached to the top of the open frame, holes in the cross piece and in the top of the bottom storage box connected by tubes, wheels attached to the bottom storage box, a pivotable handle attached to the bottom storage box near the wheels, wings pivotably attached between extensions of the bottom storage box and extensions of the open frame, a trash bag bracket pivotably attached to the open frame near its top, brackets attached to the wings that will receive the trash bag bracket when the wings are in an open position and the trash bag bracket is moved to a horizontal position.

4,350,367

ROLL BAR FOR VEHICLES, ESPECIALLY MOTOR VEHICLES

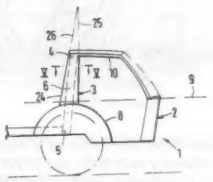
Eugen Kolb, Stuttgart, and Rainer Srock, Leonberg, both of Fed. Rep. of Germany, assignors to Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 14, 1980, Ser. No. 140,414

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1979, 2916010

Int. Cl.³ B60R *21/02*

U.S. Cl. 280—756 **14 Claims**



1. Roll bar assembly for protection of a vehicle occupant compartment under vehicle turn-over conditions, comprising segments mounted on opposite sides of a vehicle, said segments being mounted vertically and being connected together by at least one cross member, characterized by the fact that each segment comprises a pair of elements which have deformations, said deformations increasing the section modulus in a manner producing high rigidity, said elements having the same profile and being formed of rolled sections capable of manufacture in the same set of rolls on a roll-section manufacturing tool, and each pair of elements being connected together to form a hollow member which, in cross section comprises two tubular structures connected by a common rib, said tubular structures being located symmetrically with respect to a lengthwise plane and a transverse plan of the respective segment.

4,350,368

PASSIVE SEAT BELT SYSTEM FOR THREE OCCUPANT SEAT

Richard L. Frantom, Richmond; Robert L. Stephenson, Utica, and Rudy V. Thomas, Sterling Heights, all of Mich., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 10, 1980, Ser. No. 138,956

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **18 Claims**

1. A passive seat belt system for a vehicle having center and outboard passenger seating positions, a door adjacent said outboard passenger's seating position and a roof, said system comprising:

first anchor means mounted outboard of said outboard passenger's seating position;

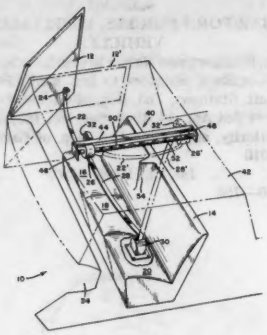
a seat belt for said outboard passenger's seating position having one end attached to said first anchor means;

second anchor means provided in said vehicle;

a seat belt for said center passenger's seating position having one end attached to said second anchor means, said second anchor means being located at a position such that said seat belt for center passenger's seating position is adapted to extend across said seating position from the inboard side thereof; and

movable means connected to said roof of said vehicle at a position adjacent to said center and outboard passengers' seating positions, each of said seat belts being connected to said movable means, said movable means being movable

to a first position in said vehicle whereby said belts are in non-restraining positions to facilitate access to said center and outboard passengers' seating positions and said mov-



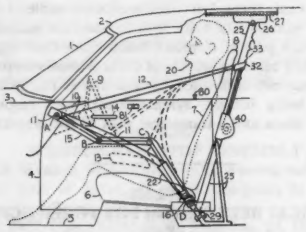
able means being movable to a second position in said vehicle whereby said belts are in restraining positions to provide seat belt restraint for said seating positions.

4,350,369

VEHICLE OCCUPANT RESTRAINING DEVICES

John J. Chika, 1350 Orchard Ridge Rd., Bloomfield Hills, Mich. 48013

Filed Sep. 8, 1980, Ser. No. 184,806
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—804 **41 Claims**



1. A vehicle seat occupant restraining device adjustably positionable into and out of the immediate proximity to the occupant of a seat located next to a rigid side or a side door of a transportation vehicle comprising:

a continuous length of suitably configured webbing or cable type material forming a combination lap-belt and shoulder-belt restraining device (**10**),

the inboard end of the lap-belt portion (**11**) anchored to the vehicle floor inboard and behind the seated occupant,

the inboard upper end of the shoulder-belt portion (**12**) adjustably anchored inboard and back of the seated occupant's head to specifically configured means (**25**), by specifically configured bracket means (**32**) adjustably engageable with said means (**25**) for adjustably fixing the effective length of the continuous overall length of the webbing or cable (**10**),

the mid-portion of said webbing or cable type material slidably passing through an apperture in a carrier assembly means (**35**), thus adjustably, automatically, variably dividing said restraining device into its lap-portion (**11**) and shoulder-portion (**12**),

the carrier assembly (**35**) configured to be operatively slidable along a track channel means (**15**) secured substantially diagonally over the inboard surface of said rigid side or door of said vehicle in nearest proximity to the outboard side of said seat,

the rearward end of the track channel located as far downwardly and rearwardly from said seat as practical, its forward end located as far forwardly and upwardly from said seat as practical,

means to slidably, operatively propel said carrier assembly means (**35**) back and forth between the opposite ends of said track channel means (**15**),

means to repeatedly, securely lock said carrier means at the rearward and downward end of said track channel means to prevent its unwanted dislocation therefrom,

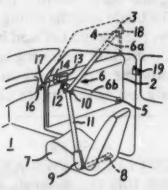
means to repeatedly unlock said carrier means therefrom.

4,350,370

BELT SHIFTING MECHANISM FOR A PASSIVE VEHICLE RESTRAINT BELT SYSTEM

Juichiro Takada, 3-12-1 Shinmachi, Setagayaku, Tokyo, Japan

Filed Nov. 24, 1980, Ser. No. 210,140
Claims priority, application Japan, Nov. 27, 1979, 54-163222[U]
Int. Cl.³ B60R *21/02*
U.S. Cl. 280—804 **10 Claims**



1. A belt shifting mechanism for use in a passive vehicle restraint belt system comprising a link rod and a paired slider mounted within a slide rail, said paired slider having a front slider and a rear slider, said slide rail being mounted on the inner face of the vehicle door, said link rod being attached at one end to the vehicle body adjacent the front edge of the vehicle door opening and at the other end to the front slider such that in response to the opening and closing of the vehicle door the link rod causes the front slider to slide forwardly and backwardly within the slide rail, said rear slider having attached thereto a drive member which in response to the motion of the rear slider in the slide rail causes an occupant restrain belt to shift between an occupant restraining position and an occupant releasing position, the front slider and the rear slider being releasably attached to each other by releasing means, said releasing means being adapted to cause the front and rear slider to remain attached and to move together when the paired slider is caused by the link rod to move within the rear portion of the slide rail in response to the movement of the vehicle door between a closed position and a partially opened position, and said releasing means being adapted to disengage said front slider and rear slider at a predetermined point on the slide rail forward of said rear portion such that only the front slider is caused by the link rod to slide forwardly in the slide rail beyond the predetermined point in response to the opening of the vehicle door from a partially opened to a fully opened position, said rear slider thereby acting upon said drive member to shift the occupant restraint belt between an occupant restraining position and an occupant releasing position only when the vehicle door is moved between a closed position to a partially opened position.

4,350,371

SUBSEA PIPE CONNECTOR

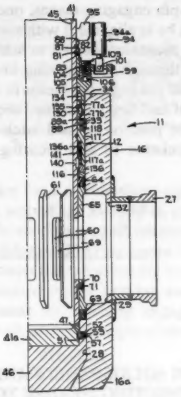
Glen E. Lochte, Houston, and Jackie R. Allen, Porter, both of Tex., assignors to FMC Corporation, Chicago, Ill.

Filed Mar. 31, 1980, Ser. No. 135,849

Claims priority, application United Kingdom, Apr. 2, 1979, 7911437

Int. Cl.³ F16L *41/00*

U.S. Cl. 285—18 10 Claims



1. A subsea connector for releasably connecting two lengths of pipe, said connector comprising:

a generally cylindrical inner member having a bore extending axially from one end thereof through a portion of said inner member, said inner member having at least one port extending from said bore radially through a wall to the outside of said inner member;

means for connecting said first length of pipe to communicate with said axial bore of said inner member;

a generally cylindrical outer member having an axially extending passage to receive said inner member, said outer member having first and second annular grooves in an inner wall thereof, said first groove being adjacent said radial port of said inner member when said inner member is operatively positioned in said axial passage of said outer member, said outer member having a passage extending radially outward from said first annular groove through a wall to the outside of said outer member;

means for connecting a second length of pipe to the outside of said wall of said outer member with said second pipe communicating with said radial passage in said wall of said outer member;

first and second annular sealing means mounted between said inner wall of said outer member and an outer wall of said inner member with said first sealing means mounted between said first groove and a first end of said outer member and said second sealing means mounted between said first groove and a second end of said outer member to facilitate the transfer of fluid from said axial bore of said inner member through said radial port and said groove to said radial passage of said outer member;

an annular locking ring mounted around said inner member, said locking ring being biased radially inward;

an annular setting ring mounted adjacent said locking ring, said setting ring having a cam surface for expanding said locking ring radially outward into a portion of said second groove in said outer member upon axial movement of said setting ring to lock said inner member in operating position inside said axial passage of said outer member; and

a hydraulic ram connected between said inner member and said setting ring to provide axial movement of said setting ring.

4,350,372

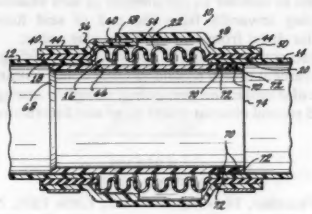
EXPANSION COUPLING FOR LARGE DIAMETER PLASTIC PIPES

Duane D. Logsdon, 1708 Calavera Dr., Fullerton, Calif. 92631

Continuation-in-part of Ser. No. 114,051, Jan. 21, 1980. This application Jul. 21, 1980, Ser. No. 170,477

Int. Cl.³ F16L *27/12*

U.S. Cl. 285—45 5 Claims



1. An expansion coupling connecting a first pipe and a second pipe which comprises:

an imperforate expansion means having a first cylindrical member capable of coaxially fitting around and being sealed to a first pipe and a second cylindrical member coaxially fitting around and being sealed to a second pipe and a cylindrical bellows means integrally formed with and interspaced between said first and said second cylindrical members;

a sliding sleeve means including a first and a second sleeve member, said first sleeve member having a first circular collar and a second circular collar integrally formed together, said second sleeve member having a third circular collar and a fourth circular collar integrally formed together, said first and third cylindrical collars including cutouts means enabling said first and third collars to be squeezed so as to reduce in diameter, said second and fourth collars being circumferentially continuous, said first collar fitting coaxially around said first cylindrical member to locate said first cylindrical member between said first pipe and said first collar of said first sleeve member, said third collar fitting coaxially around said second cylindrical member to locate said second cylindrical member between said second pipe and said third collar of said second sleeve member, said second collar coaxially located around at least a portion of said bellows means, said portion of said bellows means movable within said second collar, said fourth collar coaxially located around said second collar, said second collar slidably movable within said fourth collar;

a first and a second attaching means for fixedly attaching said first collar of said first sleeve member and said first cylindrical member to said first pipe and said third collar of said second sleeve member and said second cylindrical member to said second pipe respectively;

said cylindrical bellows means comprising a cylindrical flexible member formed into a bellows such that a cross-section through the longitudinal axis of said cylindrical flexible member has a sinusoidal shape, said sinusoidal shape defining a plurality of arcuate sectors alternately pointing toward the center of said cylindrical flexible member and away from the center said cylindrical flexible member, said bellows sized such that the internal diameter of said bellows measured across said arcuate sectors of said bellows projecting toward the interior of said bellows is greater than the inside diameter of either of said first or said second pipes;

an internal sleeve member extending within the interior of said expansion means and having one end sealably attached to the interior of one of said first or said second pipes and extending from said attachment through the

interior of said bellows means and movably sealing against the interior of the other of said first or said second pipe;

said second circular collar having a plurality of channels extending from said first circular collar longitudinally along a portion of its outside surface to a point proximal to the end of said second circular collar which is distal from said first circular collar and extending radially from said outside surface through a portion of said second collar;

said fourth circular collar including a plurality of projections equal in number to the number of said channels and projecting inwardly from the end of said fourth circular collar distal from said third circular collar;

said projections fitting in said channels guiding the sliding movement of said second circular collar within said fourth circular collar and preventing complete disengagement of said second circular collar from said fourth circular collar.

4,350,373

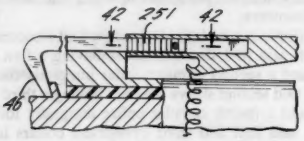
COUPLING DEVICE

Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424

Division of Ser. No. 920,403, Jun. 29, 1978, Pat. No. 4,209,190, which is a division of Ser. No. 659,370, Feb. 19, 1976, Pat. No. 4,108,475, which is a division of Ser. No. 479,667, Jun. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 427,149, Dec. 21, 1973, abandoned. This application Apr. 7, 1980, Ser. No. 138,216

Int. Cl.³ F16L *21/00*

U.S. Cl. 285—55 **6 Claims**



1. A coupling device comprising, in combination, a socket member and a plug member adapted to be removably and adjustably disposed in said socket member, said plug member including inner walls defining a bore running therethrough and at least one securing means, said plug member comprising a conical-like member including a first tubular end segment, an intermediate segment and a second end segment connected to the wider end segment of said conical-like member; the inner bore of said plug member running through each of said first end, intermediate and second end segments of said plug member, said socket member comprising a body portion including inner walls defining a passageway running therethrough, said body portion of said socket member including first and second end portions, and an intermediate portion, said passageway in the form of a bore running through each of said portions, said bore defining a tapered passage, the wide segment of which extends from said first end portion into said intermediate portion, the first tubular end segment and intermediate segment of said plug member being adapted to seat in said tapered passage of said socket member, said tapered passage of said socket member including a wear-resistant lining material which contacts the outer surface of said conical-like segment of said plug member when said plug member is seated in said tapered passage of said socket member, said second end portion of said socket member including attaching means for attaching said socket member to a conduit, said plug member being adapted to be retained and adjustably positioned in said passageway to form a substantially fluid-tight seal with said socket member, whereby as portions of said socket member in contact with said plug member wear, said plug member can be repositioned in said socket member to continue to maintain a substantially fluid-tight seal with said socket member, said socket member further including at least one connecting member adapted to engage said securing means of said plug member to retain said plug member in said socket member in substantially fluid-tight engagement, said connecting member of said socket member comprising at least one connecting rod, said rod comprising at least first and second sections, said first section including a first end pivotally mounted to said socket member, and a second end which includes a longitudinal slot and at least one opening, in communication with said longitudinal slot, said second section in part including a first end which includes a latch-like member for engaging said securing means of said plug member, and a second end disposed in said longitudinal slot and including at least two pin engaging means, one pin engaging means being adapted to be in alignment with said opening of said first section, and pin means connected to said connecting rod and adapted to pass through said opening in said first section and engage one of said pin engaging means in said second section to fix the position of said first and second sections relative to each other and fix the position of said latch-like member of said second section relative to said securing means of said plug member.

4,350,374

HEADER FOR SOLAR-PANELS AND A DEVICE FOR CONNECTING HEADER TO PANEL

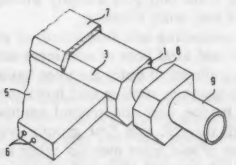
Aurelio Brollo, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Oct. 3, 1979, Ser. No. 81,542

Claims priority, application Italy, Oct. 4, 1978, 28393 A/78

Int. Cl.³ F16L *47/00*

U.S. Cl. 285—132 **2 Claims**



1. A terminal conduit for solar panels comprising:

a prismatic housing surrounding a cavity which extends longitudinally therethrough, said housing having an elongate aperture therein which communicates with said cavity and has its longer dimension disposed parallel to the longitudinal axis of the housing,

a slab having a plurality of conduits extending therethrough disposed within one end in the aperature with its through conduits communicating with the said cavity, and

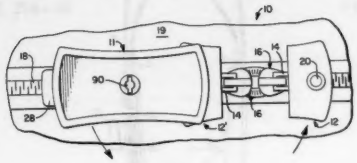
means for supporting the slab in the aperature and forming a fluid tight seal between the housing surrounding the aperature and the slab, said prismatic body formed by two sections which are joined, one to the other, in correspondence of a plane that passes through the axis of the prismatic body and through the mid-plane of the aperture, and wherein said terminal conduit compries means for joining together the said two sections, said means for joining together the two sections comprising a cantilever fin on the surface of each of the two sections, which, once joined together, form the prismatic body, the said fins each having one face lying on the plane that passes through the axis of the prismatic body and through the mid-plane of the aperture and a pair of sections fitted over said fins pressing the fins together.

4,350,375

DOUBLE-SLIDER ZIPPER LATCHING DEVICE

Lazlo Bako, Woodcliff Lake, N.J., assignor to Presto Lock, Inc., Garfield, N.J.

Filed Feb. 8, 1980, Ser. No. 119,977
Int. Cl.³ A44B *19/00*
U.S. Cl. 292—24 23 Claims



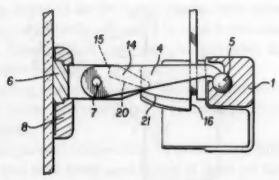
1. A latching device for a double-slider zipper arrangement comprising first and second tab assemblies, each tab assembly having an opening for receiving a pull tab pivotally connected to one of the zipper sliders and having means therein for engaging the pull tab to attach the tab assembly to the pull tab, and a latch assembly mounted on the first tab assembly, the latch assembly having means for latching engagement with the second tab assembly to latch the zipper sliders together.

4,350,376

LOCKING DEVICE FOR SWIVELING WINDOW

Jacques Bascou, Boulogne, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

PCT No. PCT/FR79/00098, § 371 Date May 13, 1980, § 102(e) Date May 13, 1980, PCT Pub. No. WO80/00017, PCT Pub. Date Jan. 10, 1980
PCT Filed Oct. 29, 1979, Ser. No. 206,546
Claims priority, application France, Nov. 3, 1978, 78 31210
Int. Cl.³ E05C *17/32*
U.S. Cl. 292—263 2 Claims



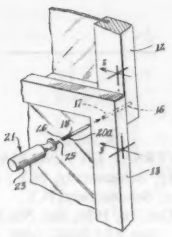
1. A device for locking a swiveling window in a closed and partially opened position comprising:
- a base mounted to said window;
- a body rest member;
- a control lever pivotably mounted on said rest member and having an elongated channel formed therein;
- a yoke member rotatably mounted on said base;
- a driving rod having a first end thereof pivotably mounted to said yoke member and a second end thereof slidably mounted within said channel of such control lever; and
- means operably connected to said control lever and said yoke for locking and unlocking of said control lever in said closed and partially opened position wherein said means for locking and unlocking said control lever further comprises a first and second cam for mutual abutment and sliding contact, said first cam being integrally formed with said yoke and said second cam being integrally formed with said control handle.

4,350,377

LOCK DEVICE AND METHOD FOR SECURING WINDOW SASHES IN A FIXED RELATIVE POSITION

Thomas D. McCarthy, 7 Rae La., Norwalk, Conn. 06850

Filed Mar. 13, 1980, Ser. No. 130,022
Int. Cl.³ E05C *17/54*
U.S. Cl. 292—288 16 Claims



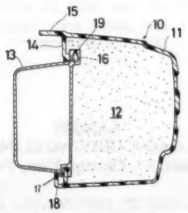
1. Lock means for securing first and second bodies, which are mounted for relative sliding movement, in fixed relative position, each of said bodies having a hole extending transversely to the direction of said sliding movement, said holes being in axial alignment when said bodies are in said fixed position; said lock means comprising:
- elongate bolt means insertable into said holes when axially aligned to secure said bodies in said fixed position, said bolt means having a knurled exterior portion for frictionally engaging the interior of at least one of said holes;
- handle means; and
- means for releasably, axially attaching said handle means to said bolt means, said attaching means comprising screw means for releasably securing said handle means to said bolt means, whereby said bolt means may be inserted into and withdrawn from said holes when aligned and whereby said handle means may be released from said bolt means after said bolt means is inserted into said holes.

4,350,378

BUMPER FOR USE ON VEHICLES

Fumio Wakamatsu, Okazaki, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 22, 1980, Ser. No. 180,434
Claims priority, application Japan, Aug. 29, 1979, 54/119671[U]
Int. Cl.³ B60R *19/08*
U.S. Cl. 293—120 6 Claims



1. A bumper for vehicles comprising:
- a rim member formed from setting of molten material as a result of a molding operation,
- a foamed urethane form positioned within said rim member to absorb shocks to which the bumper may be subjected, and
- a reinforcement member to reinforce the bumper positioned rearwardly of said foamed urethane form and affixed to

said rim member when the latter is formed, said reinforcement member having at least one extended portion which projects into said foamed urethane form and defining apertures through which the molten material is poured to form said rim member, whereby said foamed urethane form and said reinforcement member are integrally fixed to each other upon setting of the molten material.

4,350,379

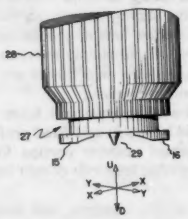
UNIVERSAL LIFTING MAGNET

Donald C. Peroutky, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 10, 1980, Ser. No. 195,865

Int. Cl.³ B66C *1/04*

U.S. Cl. 294—65.5 **6 Claims**



1. A universal electromagnet capable of lifting different magnetic parts comprising:

a magnetic base ring;

a pair of approximately semi-annular, shaped magnetic pole pieces; and

magnetic core and coil structures between said base ring and each pole piece;

said pole pieces being shaped in mirror image fashion to have inner curved surfaces for lifting cylindrical parts and outer flat surfaces for lifting parts with substantially plane surfaces, said flat surfaces further having undercut areas that are filled with non-magnetic material and provide small air gaps, whereby heavy and light weight parts with plane surfaces can be lifted and quickly released.

4,350,380

LOAD CARRYING SLINGS

William C. Williams, 47, Channel View, Port Talbot, Glamorgan, Wales

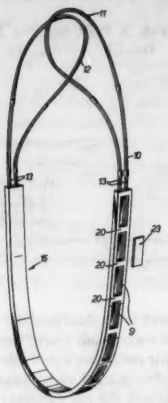
Filed Mar. 20, 1980, Ser. No. 132,013

Claims priority, application United Kingdom, Mar. 27, 1979, 7910557

Int. Cl.³ B66C *1/18*

U.S. Cl. 294—74 **7 Claims**

1. A load carrying sling comprising an internal flexible load carrying tension element, and a flexible sheath formed with passage means for receiving said tension element, said sheath extending over a substantial length of said tension element and being formed with a plurality of longitudinally spaced viewing apertures peripherally framed by the material of the sheath to include transverse bridges separating the viewing apertures and providing adjacent walls of the passage means whereby



substantially all parts of said element can be inspected and substantially the full length of said element is protected.

4,350,381

GRIPPER WITH SERIALLY PIVOTED FINGERS

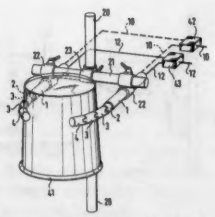
Wolf D. Hellmann, Leichlingen, Fed. Rep. of Germany, assignor to Colortronic Reinhard & Co. KG, Friedrichsdorf, Fed. Rep. of Germany

Filed Oct. 8, 1980, Ser. No. 195,037

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1979, 2940916

Int. Cl.³ B66C *3/16*

U.S. Cl. 294—88 **14 Claims**



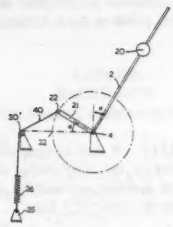
1. Gripper for use in a manipulator which removes, transports and unloads production pieces, particularly pieces made of plastic in an injection molding machine, comprising a base member and a plurality of finger members which can pivot in sequence and toward each other and which are uniformly shaped, each finger member having a hydraulic cylinder for motive force, and which can be pneumatically swung into an operating position where they make contact with the objects to be gripped, each individual finger member (3) having a cylindrical shape, each having an axially parallel eccentric bore hole (14) which accommodates a piston (5) for imparting pivoting movement to the finger member; a head of the piston acting upon a rear surface (15) of a finger member immediately in front when pressure is applied causing the latter to pivot around a bolt (11) located beside the piston in a frontal area of each finger member.

4,350,382

BALANCING DEVICE AND FOLDABLE PLATFORM SIDEBOARD

Emmanuel S. M. Spronck, Julianalaan 38, Margraten, Netherlands

Filed Dec. 20, 1979, Ser. No. 105,661
Claims priority, application Netherlands, Dec. 21, 1978, 7812389
Int. Cl.³ B62D 27/00
U.S. Cl. 296—38 2 Claims



1. A balancing device for a part rotatable about a horizontal axis in a frame comprising:

(a) a lever arm fixedly connected with one end at said horizontal axis to said part to be balanced so as to define a right angle therewith, said horizontal axis being fixed in said frame and said part to be balanced is fully balanced in any angular position of said part when said part is balanced in only one angular position thereof;

(b) a pull or press member pivotally mounted about a point of said frame and being pivotally connected to the other end of said lever arm, said pull or press member being a pulling cable guided over a guide wheel disposed at said point of said frame, said point and said horizontal axis being located in the same plane, said point of said frame being adjustably mounted in said frame and being fixed in said frame when said part is balanced in said only one angular position;

(c) a spring member having linear characteristics mounted in said frame and operatively connected to said pull or press member;

(d) said pivotal connection between said pull or press member and said lever arm being at least partially displaceable about a circle concentric about said horizontal axis, with said lever arm defining the radius of said circle;

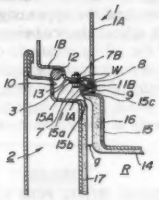
(e) said pull or press member being so mounted about said point that any pulling or pressing force exerted thereby on said lever arm in all positions of said lever arm about said circle extends through said point, whereby in a position wherein the center of gravity of said part to be balanced is positioned directly above said horizontal axis, the direction of said pulling or pressing force extends in a longitudinal direction defined by said lever arm, with the length along which said spring member is biased being equal to the distance between said point of said frame and said pivotal connection between said pull or press member and said lever arm, with said point of said frame being adjustable along said longitudinal direction defined by said lever arm when said lever arm is in a horizontal plane, with said horizontal axis, said point of said frame and said pivotal connection of said pull or press member to said other end of said lever arm all being located in said horizontal plane when said lever arm is in said horizontal plane.

4,350,383

INSTRUMENT BOARD MOUNTING STRUCTURE

Masaaki Kikuta, Sayama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 24, 1979, Ser. No. 60,045
Claims priority, application Japan, Sep. 8, 1978, 53/109698
Int. Cl.³ B62D 25/14
U.S. Cl. 296—72 1 Claim



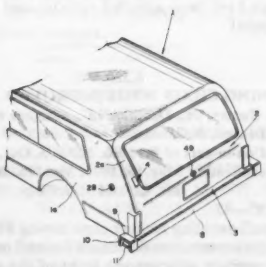
1. An instrument board mounting structure of the type which comprises a front pillar which includes an inner pillar connected to an outer pillar having a side surface to which a vehicle door is pivotally mounted for opening and closing the door, the connection between said inner pillar and said outer pillar defining a coupled portion which is normally exposed in the space defined between the inner surface of the door when closed and the most adjacent surface of an instrument board mounted to said front pillar, the side surface of said outer pillar extending outwardly from said coupled portion, the improvement comprising a lateral end on said instrument board fixed to said front pillar and structurally arranged to cover said coupled portion of said inner and outer pillars, said lateral end extending outwardly beyond said coupled portion to said side surface of said outer pillar and being secured thereto by fastening means on the side of the side surface facing said door opening, said lateral end comprising a distal end thereof which is secured to said side surface, a first bent portion connected to said distal end and to a second bent portion, and a third bent portion, spaced from said second bent portion to an extent sufficient to define a condition for determining a zero or greater space between an instrument panel pad and a door lining when said door is closed.

4,350,384

DEVICE FOR OPENING A BACK DOOR OF AN AUTOMOTIVE VEHICLE

Akira Yasuda, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 12, 1980, Ser. No. 206,107
Claims priority, application Japan, Nov. 17, 1979, 54-149879
Int. Cl.³ B60J 1/00
U.S. Cl. 296—146 8 Claims



1. A device for opening a back door of an automotive vehi-

cle, the back door being used to close a back opening of the automotive vehicle, comprising:

a door-lock device for securing the back door when the back door closes the back opening of the automotive vehicle;

a door-lock release device for causing the door-lock device to release the back door;

a foot pedal placed at a rear and lower portion of the automotive vehicle in a position where the foot pedal is readily accessible;

means for lifting the back door in such a way that the back door rotates around the upper edge thereof to be opened, the door-lock release device being actuated in response to operation of the lifting means to cause the door-lock device to release the back door; and

means for actuating the lifting means in response to actuation of the foot pedal, the actuating means being mounted within the body of the automotive vehicle.

4,350,385

SLIDING ROOF FOR VEHICLES

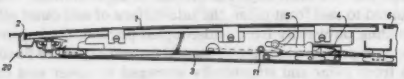
Walter Schätzler, Aufhausen, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Munich, Fed. Rep. of Germany

Filed Apr. 11, 1980, Ser. No. 139,410

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1979, 7910778[U]

Int. Cl.³ B60J *7/04*

U.S. Cl. 296—222 **9 Claims**



1. Sliding roof for automotive vehicles comprising a fixed roof section with an aperture, a sliding top for sealing off the roof aperture in its closed position, said sliding top being connected by swing-out levers to slide shoes guided in lateral guide rails in a manner enabling said sliding top to be selectively lowered from its closed position and pushed underneath a fixed, rearward roof section by shifting of said slide shoes, or swung out in an upward direction to a position wherein a rear end of the top is above the fixed roof section; a mounting plate attached to each of the lateral guide rails and carrying a guide pin that cooperates with a slotted guide in a respective one of the swing-out levers; a guide plate mounted to each lateral guide rail so as to be adjustable longitudinally relative to the lateral guide rail and which causes said guide plate, during closing of the sliding top, to be contacted by a guide member that is fixedly connected to the sliding top for guiding the sliding top into its closed position, and disengageable securing means securing guide plates against movement relative to lateral guide rails when engaged characterized in that the guide pin carrying mounting plates and the guide plates have detent elements which cooperate with each other for at least temporarily retaining said guide plates in a relative position to which they have been adjusted without said securing means being engaged.

4,350,386

RECLINING CHAIR WITH IMPROVED ACTUATION

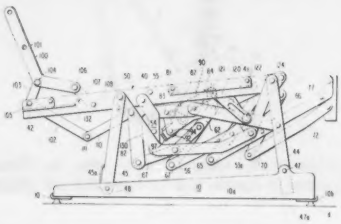
Walter C. Rogers, Jr., Denton, N.C., assignor to Parma Corporation, Denton, N.C.

Continuation-in-part of Ser. No. 199,595, Oct. 22, 1980. This application May 15, 1981, Ser. No. 264,144

Int. Cl.³ A47C *1/02*

U.S. Cl. 297—85 **18 Claims**

1. In a wall-avoiding recliner chair having a fixed base, a seat and backrest mounted on the base, a footrest movable between retracted position adjacent the front of the seat and an extended position projected forwardly from the front of the seat, the improvement comprising in combination, a seat linkage mounting the seat relative to the base for movement in response to the weight of an occupant of the chair between a closed position wherein the footrest is retracted and a reclining position with the seat projected forwardly relative to the base and with the footrest extended, a footrest linkage mounting the footrest relative to the seat for movement between said positions thereof, linkage means interconnecting the footrest linkage and the seat linkage for actuating the footrest between extended and retracted positions in response to movement of the seat linkage caused by the weight of the chair occupant, lock means releasably holding the seat linkage in said closed position against movement into a reclining position under the weight of an occupant of the chair; and release means for releasing the lock mechanism to permit the seat linkage to move from said closed position to a reclining position, said



lock means including first and second knuckle links, a first pivot means interconnecting the knuckle links for movement relative to each other, a second pivot means interconnecting the first knuckle link with the footrest linkage, and a third pivot means mounting the second knuckle link relative to the seat, said knuckle links being movable between a first position locking the seat linkage against movement out of said closed position thereof and wherein said first, second and third pivot means are in substantial alignment with each other, and a second position freeing the seat linkage for movement to a reclining position and wherein said first pivot means is displaced to one side of a line drawn through said second and third pivot means, and wherein said release means includes a handle connected to said second knuckle link for pivoting the knuckle links relative to each other into said second position thereof.

4,350,387

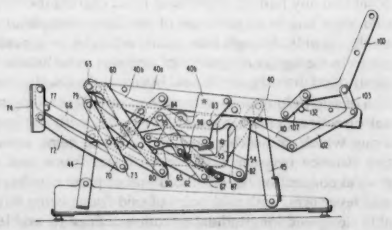
RECLINING CHAIR WITH IMPROVED ACTUATION

Walter C. Rogers, Jr., Denton, N.C., assignor to Parma Corporation, Denton, N.C.

Filed Oct. 22, 1980, Ser. No. 199,595

Int. Cl.³ A47C *1/02*

U.S. Cl. 297—85 **32 Claims**



1. In a wall-avoiding recliner chair having a fixed base, a seat and backrest mounted on the base, a footrest movable between retracted position adjacent the front of the seat and an extended position projected forwardly from the front of the seat;

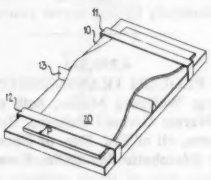
the improvement comprising in combination, a seat linkage mounting the seat relative to the base for movement in response to the weight of an occupant of the chair between a closed position wherein the footrest is retracted and a reclining position with the seat projected forwardly relative to the base and with the footrest extended, a footrest linkage mounting the footrest relative to the seat for movement between said positions thereof, linkage means interconnecting the footrest linkage and the seat linkage for actuating the footrest between extended and retracted positions in response to movement of the seat linkage caused by the weight of the chair occupant, lock means releasably holding the seat linkage in said closed position against movement into a reclining position under the weight of an occupant of the chair; and release means for releasing the lock mechanism to permit the seat linkage to move from said closed position to a reclining position.

4,350,388

BACKRESTS

Hans Weiner, Täby, Sweden, assignor to Spina-Trac AB, Stockholm, Sweden

Continuation-in-part of Ser. No. 817,008, Jul. 19, 1977, abandoned. This application Oct. 3, 1978, Ser. No. 948,285
Claims priority, application Sweden, May 23, 1978, 7805844
Int. Cl.³ A47C 7/46
U.S. Cl. 297—284 **13 Claims**



1. A backrest suitable for use as an addition to chairs, car seats, and the like, comprising a rigid base member in the form of a substantially rectangular base plate having an upper face, two long sides, and two short sides at the ends of the base plate, an inherently elastic, substantially rectangular and curved support member having two long sides and two short sides, the short sides of the support member being adjacent to the ends of the base plate, two connecting means which respectively connect the support member to the base plate at positions adjacent to the ends of the support member, at least one of these connecting means being such as to permit sliding movement of the respective end of the support member relative to the base plate; and a distance member having substantially the same length as the width of the support member and arranged between the base plate and the support member, intermediate their ends, thereby spacing the support member from the base plate between said ends, said distance member being movable lengthwise of the base plate, characterized by the following:

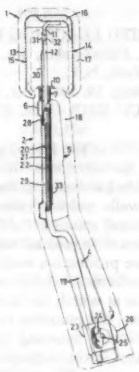
at least one of said connecting means extends transversely over the support member and engages the upper face of the support member at a short distance from an adjacent short side thereof so as to make the support member positively follow and press against the base plate, each long side of the base plate being along its central portion provided with a plurality of notches spaced apart from each other, opposite notches on the two long sides defining a pair of cooperating fixation means; engagement means are provided on the distance member for engagement with any selected pair of cooperating notches, and said engagement means by the combined influence of the inherent elasticity of the support member and of the said engagement of the upper face of the support member are pressed in a selected pair of notches and are releasable therefrom by overcoming the said inherent elasticity, and the support member is held by the distance member in a convex curvature relative to the base member having an apex of curvature where it is supported by said distance member, said apex being adjustable by said distance member, said apex being adjustable longitudinally of the base member by engagement of the said engagement means of the distance member with different pairs of cooperating notches.

4,350,389

SAFETY HEADREST FOR A VEHICLE SEAT

Nils O. Pärsson, Trollhättan, and Sten E. Nilsson, Sjuntorp, both of Sweden, assignors to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed Jun. 4, 1980, Ser. No. 156,345
Claims priority, application Sweden, Jun. 8, 1979, 7905029
Int. Cl.³ A47C 1/10
U.S. Cl. 297—410 **11 Claims**



1. A safety headrest for a seat, especially a vehicle seat, said headrest being mounted, via a holding means, on the back support of the seat, said holding means allowing the headrest to be adjusted in height relative to the seat, characterized in that the headrest comprising a frame structure having in cross-section essentially the shape of an inverted U having a web and a forward leg portion and a rear leg portion, the web being secured to a bar displaceably mounted in a guide in the upper part of the back support, the bar being connected to an adjusting mechanism for remotely controlling the height of the headrest and said leg portions embracing the upper portion of the back support and adjoining the front and the rear, respectively, of the back support, said headrest being lowerable to a position where the web portion comes into contact with the uppermost part of the back support, said adjusting mechanism including a flexible cable displaceably located in a cable tube and a housing, one end of the cable being connected to the bar, the other end of said cable coacting with cogged means rotatably mounted in the housing and manually operable for adjusting the height of the headrest.

4,350,390

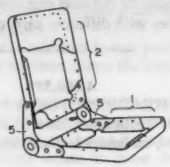
SEAT

Hiroshi Ogawa, Iwakuni, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed May 6, 1980, Ser. No. 147,049
Claims priority, application Japan, May 11, 1979, 54-56906
Int. Cl.³ A47G 7/16
U.S. Cl. 297—452 **7 Claims**

1. A seat frame formed from a laminate comprising an inner non-metallic material and two metal foil layers, said frame comprising a unitary structure including raised peripheral ribs forming two side walls and two end walls all of which are

continuous, at least three of said walls being separately reinforced by respective reinforcing members each formed by



inner extensions of the respective walls folded back and held to the wall from which it extends.

4,350,391

IN SITU LEACHING PROCESS

Tsoung-Yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Company, New York, N.Y.

Filed Aug. 19, 1980, Ser. No. 179,560

Int. Cl.³ E21B *43/28*; E21C *41/14*

U.S. Cl. 299—4 **4 Claims**

1. In the process for in situ leaching of mineral values from a mineral-bearing subterranean formation comprising the pumping of a suitable lixiviant into the formation through one or more injection wells under pressure, allowing the lixiviant to leach out the mineral values in the formation, and removing the lixiviant pregnant with mineral values from said formation through one or more production wells spaced from said injection wells, the improvement which comprises:

regulating the rate at which the lixiviant is pumped into the formation so that the pumping rate remains at or slightly above the minimum pumping rate necessary to supply adequate lixiviant to the formation and

concurrently decreasing the pumping rate proportionally to the depletion of the mineral value in said formation.

4,350,392

COAL EXTRACTION IN A LONGWALL WORKING

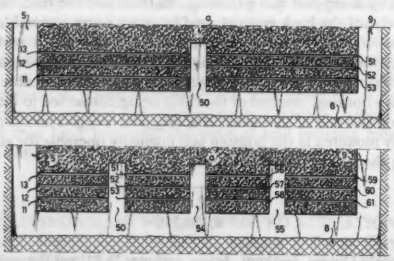
Heinz W. Wild, Essen, Fed. Rep. of Germany, assignor to Ruhr Kohle AG, Fed. Rep. of Germany

Filed Sep. 16, 1976, Ser. No. 723,814

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1975, 2547712

Int. Cl.³ E21C *35/20*

U.S. Cl. 299—13 **2 Claims**



1. A method of longwall coal mining comprising the following steps:

a. exposing a longwall coal face in a coal seam between a roof of upper strata and a floor of lower strata,

b. providing at substantially right angles to the coal face two galleries spaced laterally from each other,

c. providing a screw conveyor having an associated channel coextensive with the coal face, the channel being open along one side to permit introduction of coal into said screw conveyor and being defined by floor plate means, roofing plate means, and a rear wall plate means extending between and interconnecting said floor and roofing plate means,

d. positioning the channel of said screw conveyor adjacent and in slightly spaced relation to the coal face with the floor plate means on the lower strata and the roofing plate means in supporting contact with the upper strata, and with the axis of said screw conveyor parallel to the coal face, the channel being open towards the coal face,

e. adjusting the height of said rear wall plate means to extend between said floor plate means and said roofing plate means, whereby the channel and the coal face cooperate to surround said screw conveyor,

f. drilling a plurality of long holes extending from one gallery to the other and spaced from the longwall face and from each other a predetermined distance,

g. loading each hole with explosive charge,

h. firing the charges to extract the coal so that the coal face is cut off by an amount corresponding in length to the length of such face and in height corresponding to the height of the coal seam and in depth corresponding to the predetermined effectiveness of the charge, whereby the extracted coal is loaded into the channel associated with said conveyor, and

i. removing extracted coal at all points along the longwall face simultaneously by said screw conveyor.

4,350,393

PLOUGH TRANSMISSION

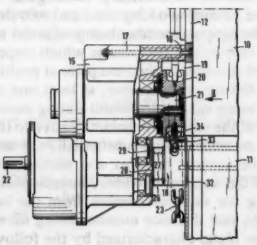
Walter Heberling; Wolfgang Muller, both of Lunen; Werner Langenberg, Werne; Gerhard Behrens, Bergkamen, and Alfred Saul, Lunen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Jul. 9, 1980, Ser. No. 167,186

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1979, 2928789

Int. Cl.³ E21C *27/32*

U.S. Cl. 299—50 **14 Claims**



1. A transmission for transmitting drive from a motor to a drive sprocket wheel for driving a drive chain of a mineral mining plough, the transmission having a housing which is directly attached to a side plate of a mine conveyor drive station, the housing being formed with a recess sized and shaped to accomodate the sprocket wheel, the recess being open at one end to permit the plough drive chain to enter and leave the sprocket wheel, and the housing being provided with attachment means adjacent to each end thereof for attaching the housing to said drive station side plate, wherein the attachment means adjacent to the housing end adjacent to said recess opening is a spacer which is detachably secured to the housing, and which is detachably securable to said drive station side plate, and wherein the attachment means adjacent to the housing end remote from said recess opening is constituted by at least one flange formed integrally with said housing, said at

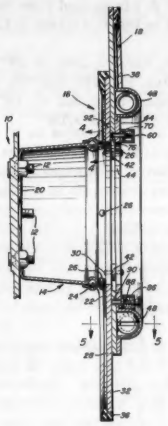
least one flange being directly attached to said drive station side plate.

4,350,394

SECTIONAL WHEEL WITH RELATIVELY ROTATABLE SECTIONS

John G. Lehtinen, 621 Lochaven, Union Lake, Mich. 48085

Filed Jun. 27, 1980, Ser. No. 163,862
Int. Cl.³ B60B *11/00*
U.S. Cl. 301—38 R **9 Claims**



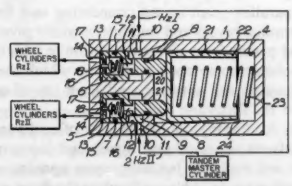
9. A pair of panel members, means joining said panel members for relative rotation about an axis disposed generally normal to said panel members and for relative angular displacement of one of said members relative to the other member between a first predetermined position and second and third positions with said one member rotated substantially 180° in opposite directions relative to the other member from said first position, and spring means connected between said panel members operative to yieldingly resist angular displacement of said one panel member relative to said other panel member from said first position toward either of said second and third positions, and latch means operative to releasably retain said one panel member in either of said second and third positions.

4,350,395

PRESSURE CONTROL UNIT

Hans-Henning Lüpertz, Darmstadt, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 114,798, Jan. 24, 1980, abandoned. This application Nov. 24, 1980, Ser. No. 210,181
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1979, 2907515
Int. Cl.³ B60T *11/28*
U.S. Cl. 303—6 C **10 Claims**



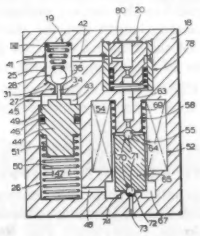
1. A pressure control unit comprising:
a housing having a longitudinal axis;
two pressure control valves disposed in said housing parallel to each other and said axis, each of said two control valves controlling a different brake circuit and being connected to a pressure generator on an inlet side thereof and to a wheel cylinder on an outlet side thereof; and
a hollow cup-shaped piston disposed in said housing coaxial of said axis tiltable within limits about said axis and having the outer surface of its closed end in direct operative relationship with adjacent ends of said two control valves to distribute a common control force to said two control valves;
said piston having an outer surface which is at least essentially conical having a larger end disposed adjacent said two control valves, coaxial of said axis and conformed to a housing bore and a smaller end close to said control force.

4,350,396

MODULATOR ASSEMBLIES FOR VEHICLE ANTI-SKID BRAKING SYSTEMS

Ivan Mortimer, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Feb. 25, 1980, Ser. No. 124,264
Claims priority, application United Kingdom, Feb. 23, 1979, 7906551
Int. Cl.³ B60T *8/02*
U.S. Cl. 303—115 **10 Claims**



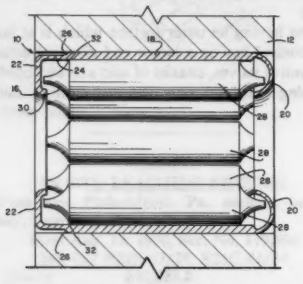
1. An anti-skid brake control system comprising a wheel having a hydraulic brake, means to sense the presence of skid conditions at the wheel during braking and thereupon to produce a skid signal, a movable wall separating first and second chambers, said first chamber being connected to the hydraulic brake and the movable wall being arranged to increase the volume of said first chamber in response to the skid signal so as to relieve the brake pressure at the braked wheel, a regulator arranged to regulate flow of fluid to said second chamber on cessation of the skid signal such that the movable wall is thereby moved progressively to reduce the volume of said first chamber so as to re-apply the brake pressure at a controlled rate, the regulator comprising a first restriction of predetermined size connected in series with a second restriction defined between two relatively movable members, relative movement of the members being controlled by the difference in fluid pressure across the first restriction such that an increase in this pressure difference causes a reduction in the size of the second restriction, a reservoir, a substantially unrestricted dump passage connecting said second chamber to said reservoir, and a dump valve member controlling said dump passage whereby on opening of said dump valve member in response to the skid signal substantially unrestricted flow of fluid is permitted from said second chamber to said reservoir.

4,350,397

LOW STRENGTH MATERIAL HOUSING BEARING

Paul M. Cornish, Plainville, and Charles E. Condon, Jr., Harwinton, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Oct. 23, 1980, Ser. No. 199,942
Int. Cl.[3] F16C 33/58
U.S. Cl. 308—212 4 Claims



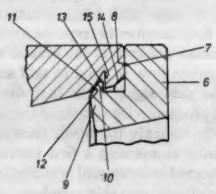
1. A bearing for use in a bore of a low strength material housing comprising: a race, a plurality of rollers contained in said race, the length of the inside of the race being greater than the race-roller contact length, said race including an annular, radially extending portion spaced lengthwise from the nearest race-roller contact point and a reduced outside diameter portion extending lengthwise from said annular portion to a point closer to said annular portion than said nearest race-roller contact point, the outside surface of the reduced diameter portion being parallel to the outside surface of the race along the race-roller contace length and the thickness of the race along the length of the reduced diameter portion being less than the thickness of the race along the race-roller contact length.

4,350,398

ROLLING BEARING HAVING SEPARATE FLANGE RING WITH SAWTOOTH-SHAPED FLANGE

Horst-Hermann Schulz, Trebel, and Johannes Köneke, Wustrow, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Continuation of Ser. No. 954,670, Oct. 26, 1978, abandoned.
This application Apr. 28, 1980, Ser. No. 144,355
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1977, 7733083[U]
Int. Cl.[3] F16C 33/58
U.S. Cl. 308—216 17 Claims



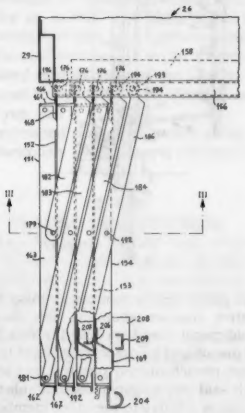
1. In a rolling bearing having a race ring with an at least partially axially directed race, and a separate flange ring connected to said race ring and having an axially directed annular shoulder extending into or over and engaging said race ring for retaining rolling elements in said bearings; the improvement wherein said flange ring is a continuous ring, said shoulder has a radially directed flange with a preformed sawtooth-shaped cross section with an inclined edge surface converging axially inwardly of said bearing, said race ring has an annular groove with a sawtooth-shaped cross section with a correspondingly inclined surface and positioned to receive said radially directed flange, said race ring having a radially extending end face, and said flange ring having a radially extending surface axially abutting said end face substantially throughout the radial extent of said end face.

4,350,399

FURNITURE WITH SPACE SAVING DOOR

Marcello Berton, Ronchi di Massa, and Dino Bertozzi, Massa, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Continuation of Ser. No. 920,072, Jun. 28, 1978, abandoned.
This application Feb. 15, 1980, Ser. No. 121,978
Claims priority, application Italy, Jul. 13, 1977, 68623 A/77
Int. Cl.[3] A47F 3/00
U.S. Cl. 312—138 R 1 Claim



1. A piece of furniture with two side parts, upper and lower parts having substantially coplanar front edges, and a space saving door comprising:

a series of panels of equal size each formed of a sheet of folded metal including a pivoted vertical edge having a projecting border on an inner side of the panel, a pair of first terminal pivots connected vertically to said projecting border, a free edge opposite to the pivoted edge and a pair of other edges interconnecting the pivoted edge with the free edge and including a pair of intermediate pivots located on said other edges between said pivoted edge and said free edge and a pair of second terminal pivots adjacent to said free edge, and wherein said first terminal pivots extend above and below said other edges;

guide means for guiding the first terminal pivots of said panels;

pairs of parallelogram means connecting said first and second terminal pivots and said intermediate pivots for moving said panels from a closed position in which the panels are coplanar, to an open position in which the panels are folded and extend outwardly adjacent one of said two side parts of the furniture; and

means for facilitating the coplanarity of said panels parallel to the front edges of said upper and lower parts when closed and avoiding jamming upon opening, said means comprising a pair of hinges fixed on the front edges of said upper and lower parts and adjacent to the front edge of one of said side parts, wherein said pair of hinges fixedly hinge the first terminal pivots of a first panel of said series adjacent to the front edge of said one of said two side

parts, wherein the second terminal pivots are disposed on said other edges adjacent to an outer side of the panel opposite to said inner side, and wherein said parallelogram means comprises a series of pairs of rods, each pair having a rectilinear central portion connected with the intermediate pivots and two ends which are offset project on opposite sides with respect to said rectilinear portion and which connect said first and second terminal pivots, and wherein the last panel of said series comprises a handle adjacent to its free edge;

said guide means comprising a pair of guides having a U section arranged horizontally in the front edges of said upper and lower parts for guiding the pair of first terminal pivots of said panels except the first panel to slide and pivot on said guide means so that the other edges of the panels remain parallel, and causing one of the two ends of each rod of said pair of rods to face to the other end of the two ends of an adjacent rod of an adjacent pair of said rods, the rectilinear parts of said rods of each pair to be aligned and substantially parallel to the panels in the closed position of the panels and confined between said guides and the edges interconnecting the pivoted edge with the free edge, and the free edges of said panels to be arrested by an outer side of the borders of the other adjacent panels in the closed position of the panels, and wherein said handle is configured to be operated for rotating said last panel to facilitate the closing and opening of said panels; and

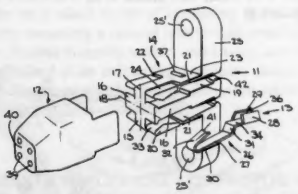
wherein said guide means comprise a pair of guides arranged horizontally in upper and lower extremities of the furniture, respectively, wherein each of said first terminal pivots comprises a vertical stud having a projecting end wherein each end except the ends of the first panel is housed in a runner, wherein the U-section of each guide comprises bottom and lateral sides to accommodate said runners and wherein said runners are guided by the lateral sides of the U-section of the upper guide and are provided in the lower part thereof with spherical cups which are engaged with the bottom side of the corresponding lower U-section to slidably support the weight of said other panels on opening and closing thereof, and wherein said hinges are fixed to the ends of said pair of guides adjacent to the front edge of said one of said two side parts.

4,350,400

CONNECTOR FOR CIRCULAR FLUORESCENT LAMP

Edwin S. Gaynor, 688 Hulls Farm Rd., Southport, Conn. 06490

Filed Jul. 14, 1981, Ser. No. 283,334
Int. Cl.³ H01R *33/08*
U.S. Cl. 339—50 C **7 Claims**



1. A four terminal female connector for a fluorescent lamp, the connector comprising:

a terminal support of molded synthetic resin having an elongated body of generally cruciform cross section formed by first and second mutually perpendicular walls intersecting at their midplanes, said midplanes defining four symmetrically arranged quadrants, and first and second flange-like members extending the first wall in spaced relation to the second wall in each quadrant adjacent to one and the other ends of the body, respectively, each second flange-like member being spaced longitudinally from the corresponding first flange-like member;

a hollow housing of molded synthetic resin having an open end for telescopically receiving the body of said terminal support, said body slidably fitting within said housing; and

an elongated electrically conductive terminal removably fitted in each quadrant of the terminal support body, each terminal being formed from a metal strip with parallel longitudinal edges, the strip having

a flat portion fitting along the surface of the respective first flange-like member on the side thereof opposite to the second wall in the corresponding quadrant,

a hooked portion formed as a bent back extension of and making an acute angle with the flat portion, said hooked portion being fitted around the first flange-like member adjacent to the one end of said body of the terminal support and extending into the space between the first flange-like member and the second wall,

an offset portion extending from the flat portion through the space between the first and second flange-like members, and

a prong-receiving portion extending longitudinally from the offset portion between the second flange-like member and the second wall to adjacent the other end of said body, the prong-receiving portion including an integral arm extending from each longitudinal edge of the strip, said arms being bent inwardly generally along the line of the respective longitudinal edge to form a channel for frictionally engaging a corresponding prong of a male connector fitting,

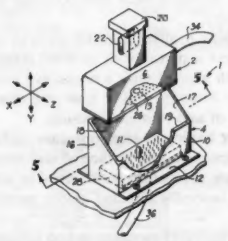
wherein the part of the strip forming the prong-receiving portion is angled relative to the midplane of the second wall to provide a flared contact surface for facilitating entry of a corresponding male connector prong into said prong-engaging channel.

4,350,401

DETACHABLE ELECTRICAL CONNECTOR ASSEMBLY HAVING IMPROVED MEANS FOR ALIGNING CONNECTOR PARTS

Ralph A. Allen, Covina, and John T. Zylkowski, Diamond Bar, both of Calif., assignors to Kortech Engineering, Inc., Fullerton, Calif.

Filed Feb. 11, 1980, Ser. No. 120,069
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—65 **2 Claims**



1. An electrical connector assembly having at least two connector parts that can be detachably connected to one another at a remote location or hazardous environment by means of remote control, each of said connector parts having a respective housing and a contact member surrounded by said housing,

the housing of a first of said connector parts comprising a front wall, a back wall, and side walls, said back wall projecting above said front wall and said side walls extending between said front and back walls, said last-mentioned housing also having an opening at one end thereof

through which to receive the housing of the second of said connector parts,

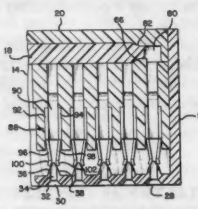
each of the front, back, and side walls of said first connector part housing being arranged with one another and adapted to be contacted by the housing of said second connector part in order that the housing of said second connector part will be accurately aligned in each of three orthogonal directions with the housing of said first connector part so as to thereby permit said second connector part to be reliably guided into connection with said first connector part via the projecting back wall and opened end of said first connector part housing in order to detachably mate the respective contact members of said two connectors parts.

4,350,402

BOARD MOUNT ZERO INSERTION FORCE CONNECTOR

George H. Douty, Mifflintown; John M. Landis, Lemoyne, and Leon T. Ritchie, Mechanicsburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 17, 1980, Ser. No. 187,647
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—74 R **9 Claims**



1. A zero insertion force connector comprising:

an outer housing having a mating front face and an oppositely directed rear face, a cavity opening into said rear face, a plurality of profiled terminal passages extending from said mating face to said cavity and at least one reaction surface adjacent each said terminal passage facing into said cavity;

a terminal housing profiled to be received in said cavity and having therein a plurality of profiled terminal receiving passages each aligned with a respective terminal passage in said outer housing, and at least one cam surface on a rear surface of said terminal housing;

a cam follower having at least one cam surface aligned to engage a respective cam surface of said terminal housing;

an actuator plate profiled to be received in said outer housing with an inwardly directed cavity receiving said cam follower;

a cam member movably mounted in said actuator plate to act against said actuator plate to effect movement of said cam follower and said terminal housing with respect to said outer housing; and

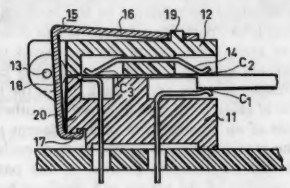
a plurality of spring contacts each received in a respective one of said terminal passages of said terminal housing and having a first mating end having at least one spring arm, with a normally relaxed first position, directed toward a respective reaction surface of said outer housing, whereby upon relative movement of said terminal housing and said outer housing each said arm being deflected to a second position allowing insertion of a terminal post into said connector without application of force.

4,350,403

CONNECTING-STRIP FOR PLUG-IN CARDS AND A CONNECTOR FITTED WITH CONNECTING-STRIPS OF THIS TYPE

Bruno Seytre, and Herve Bricaud, both of Suresnes, France, assignors to Socapex, Suresnes, France

Filed Apr. 8, 1980, Ser. No. 138,449
Claims priority, application France, Feb. 7, 1980, 80 02676
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—91 R **15 Claims**



1. A plug-in card connecting strip, comprising:

a parallelepiped base and a cover plate supporting a plurality of electrical contact elements endowed with elasticity,

the cover-plate being capable of pivotal displacement about a longitudinal axis parallel to the base into either an open or closed position, the open position being for inserting the edge of a card and the closed position being for placing the respective conductive elements of the connecting strip and of the card in contact with each other,

the closing action being produced by a clip having a generally U-shaped section including an intermediate portion and two arms, the clip being positioned parallel to the longitudinal axis of the strip with the two arms thereof being applied to respective zones of the base and cover-plate so that the clip deforms, thus ensuring closure by application of a force produced by elastic deformed clip,

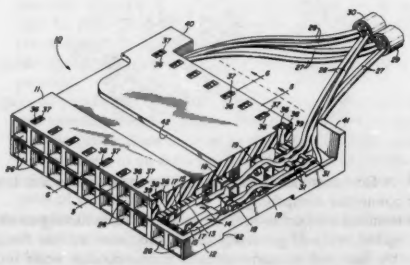
the arm of the clip which is applied against the cover plate being provided substantially at the ends thereof with bearing elements capable of pivoting within corresponding recesses in the cover plate.

4,350,404

ELECTRICAL CONNECTOR CONSTRUCTION

William C. Clark, and Clifford L. Winings, both of Lee's Summit, Mo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 24, 1980, Ser. No. 190,370
Int. Cl.³ H01R *4/02*
U.S. Cl. 339—97 R **7 Claims**



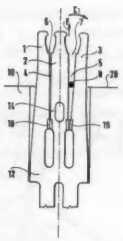
1. An electrical connector construction comprising a first and a second partial housing (11, 12) each having a base and an open side, a plurality of contact elements (14) fitted on said

base of each of said partial housings (11, 12) each of said contact elements (14) having means (15, 16) at one end for engaging electrical terminations of other connector arrangements and extending to the other end to present conductor insulation piercing means characterized in that said insulation piercing means comprises at least one blade means (20) extending outwardly from a housing (11, 12) base, each of said blade means (20) having a slot (22) parallel to the longitudinal axis of said contact (14) for engaging, respectively, an electrical conductor (27), and in that said blade means (20) is arranged on said contacts (14) in each of said partial housings (11, 12) so that when said housings (11, 12) are fitted together open sides facing, a blade means (20) of one housing (11) will extend beyond the end of the blade means (20) of the other housing (12).

4,350,405
CONNECTOR FOR INSULATED ELECTRIC CONDUCTORS

Claude Yapoudjian, Chilly-Mazarin, and Roger Pochet, La Bresse, both of France, assignors to Societe Anonyme dite: MARS-ACTEL, Paris, France

PCT No. PCT/FR80/00084, § 371 Date Jan. 25, 1981, § 102(e) Date Jan. 13, 1981, PCT Pub. No. WO80/02775, PCT Pub. Date Dec. 11, 1980
PCT Filed May 21, 1980, Ser. No. 232,044
Claims priority, application France, May 25, 1979, 79 13326
Int. Cl.³ H01R *11/20*
U.S. Cl. 339—97 P **5 Claims**



1. In a flat connector for self-stripping insulated electric conductors, said connector comprising:

a flat double fork conductive connection part comprising a central arm and two resiliently movable side arms with elongated slots between said central arm and said side arms for inserting the electric conductor to be connected, the connection part being insertable in a narrow width cavity in a stand made of insulating material, means for fixedly mounting a central arm to said stand with said side arms flexible laterally within said cavity, and wherein said longitudinal slots are inclined at least along a portion of their length with the angles of inclination converging towards the ends of said arms.

4,350,406
SEPARABLE ELECTRICAL CONNECTOR MODULE

William R. Goldbach, Hickory, N.C., assignor to General Electric Company, Philadelphia, Pa.

Filed Jan. 12, 1981, Ser. No. 224,404
Int. Cl.³ H01R *13/52*
U.S. Cl. 339—111 **4 Claims**

1. A separable electrical connector module for coupling with a mating connector module, comprising:

(a) an insulating housing having an elongated receiving passageway therein, and

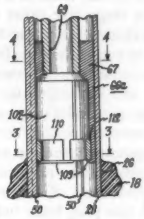
(b) a switch insert closely fitted in said passageway and comprising:

(i) a conductive container tube having an outer end adapted to receive a rod contact member of said mating connector module and an inner end;

(ii) a snuffer tube in said container tube having a central bore for receiving said rod contact member and having inside said bore a layer of ablative material;

(iii) a bore contact member within said container tube having a gas port,

(iv) a piston fixed to said bore contact member and adapted to drive said bore contact member toward the outer end of said container tube in response to the generation of gas by arcing in said bore and the passage of said gas through said port, said piston having angularly-spaced keyways in its outer periphery,



(c) the inside wall of said container tube including a plurality of axially extending keyribs angularly spaced about the longitudinal axis of said container tube and slidably received within the keyways in said piston to prevent said piston from rotating relative to the container tube,

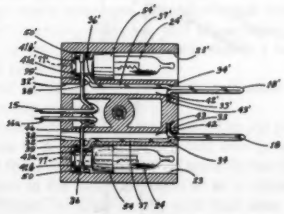
(i) said piston comprising a generally tubular metallic portion comprising angularly-spaced segments biased radially-outwardly against the inside wall of said container tube in locations between said keyribs to establish continuous electrical contact with said inside wall while said piston is stationary and while in motion,

(ii) and means biasing said segments radially outward comprising a split annular metal spring located radially inwardly of said segments and tending to expand in diameter and urge said segments radially outward.

4,350,407
SAFETY LAMP PLUG

George K. K. Tong, Hong Kong, Hong Kong, assignor to Tung Ming Electrical Co. Ltd., Taipei, Taiwan and Chane Hwa Manufacturing Co. Ltd., Kowloon, Hong Kong

Filed May 22, 1980, Ser. No. 152,491
Int. Cl.³ H01H *85/32, 85/24;* H01R *3/00*
U.S. Cl. 339—113 L **3 Claims**



1. For providing fusing protection for a light string set or other like electrical load, a safety lamp plug comprising a body including a first pair of oppositely disposed compartments, respective prong-defining electrodes within said compartments for providing a pair of prongs extending from said body at one end, a second pair of oppositely disposed compartments within said body, and characterized by a pair of fuse lamps located

within respective ones of said second pair of compartments, said body having apertures respectively proximate said prongs and opening respectively into said second pair of compartments, said fuse lamps each being slidably, removably receivable axially within the respective one of said second pair of compartments through said apertures for polarized connection in said sockets and for replacement, each of said fuse lamps having at one end only a pair of electrodes, integrally formed polarized sockets within said body for connection of said fuse lamps, said polarized sockets being remote from said apertures, each said socket including contact means for interconnecting each of said prong-defining electrodes with respective first ones of said fuse lamp electrodes and contact means for interconnecting a pair of circuit leads of a light string set or other electrical load with respective other ones of said fuse lamp electrodes, said apertures each permitting a person to observe illumination from the respective fuse lamp upon proper operation thereof, said second pair of compartments defining the first-said apertures and located within said body on opposite sides of said prongs in parallel relationship with said prongs, whereby each said aperture permits both observation of proper operation of the respective fuse lamp adjacent a corresponding prong without removal of the respective fuse lamp from said plug body and replacement of the respective lamp without disassembly of said fuse plug body but only after unplugging said prongs, said body including slots at the opposite end respectively opening into the first-said compartments for receiving prongs of an add-on plug at the opposite end of said plug, said prong-defining electrodes being adapted for providing electrical contact between the first-said prongs and said add-on plug prongs, said body having at said opposite end a pair of further apertures of reduced size relative to the first-said apertures and each oriented with respect to a respective fuse lamp for receiving a tool for ejecting the respective fuse lamp through a corresponding first-said aperture, said further apertures opening into said second pair of compartments on opposite sides of said add-on plug prong-receiving slots and being aligned longitudinally with the respective ones of said second pair of compartments and each adapted for receiving an elongated thin tool for ejecting the respective safety lamp from said body for replacement.

4,350,408

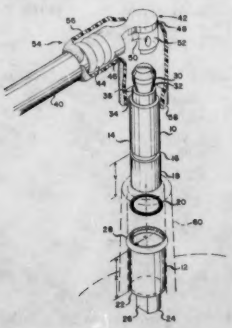
ELECTRICAL PIN CONNECTOR

Bill J. Hays, 10582 Palladium Ave., Garden Grove, Calif. 92640

Filed Jul. 23, 1980, Ser. No. 171,535

Int. Cl.³ H01R *13/46*

U.S. Cl. 339—149 S **6 Claims**



1. The improved electrical assembly comprising:

an automotive electrical means having a standard wire receiving sleeve with an annular slot therein; and

a pin connector for securing an ignition wire within said sleeve and having:

a metal shaft having a diameter less than said sleeve to be received loosely therein;

a groove in said shaft intermediate its length to oppose said annular slot of said sleeve;

a resilient retainer seated in said groove and resiliently projecting into said slot; and

a prong connector end having a bulbous end with a reduced diameter neck.

4,350,409

CONNECTOR KEYING DEVICE

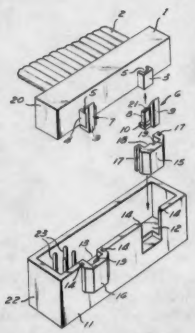
Matsuo Kato; Tomonari Ohtsuki; Yoshiaki Igarashi; Tsukasa Saito, and Toshiaki Suzuki, all of Mooka, Japan, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 81,307, Oct. 2, 1979, abandoned. This application Mar. 30, 1981, Ser. No. 248,799

Claims priority, application Japan, Oct. 5, 1978, 53-136098[U]

Int. Cl.³ H01R *13/645*

U.S. Cl. 339—186 M **13 Claims**



1. A connector keying arrangement for keying mating first and second connector parts to assure proper connection between the parts and to prevent connection to other connector parts of unlike keying comprising:

a key mount affixed to the first connector part, said key mount having means for mounting a key member thereto;

a key member removably attached to said key mount;

a key receiver mounted on the second connector part and having a key member-receiving slot therein aligned with and slidingly receiving said key member when the first and second connector parts are mated;

said key mount comprising a generally U-shaped protrusion on one face of the first connector part defining a key member mounting passageway between the interior of said protrusion and said one face, said passageway extending in the direction of connection of said first and second connector parts;

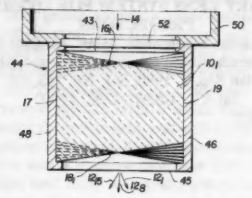
said key member comprising a base, a key projecting from said base, and a mounting leg projecting from said base parallel to said key;

said mounting leg being sized to snugly fit into said passageway, and said key lying against the exterior surface of said U-shaped protrusion.

4,350,410
MULTIPRISM COLLIMATOR

Peter O. Minott, Bowie, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 8, 1980, Ser. No. 195,228
Int. Cl.³ G02B 27/12, 5/04
U.S. Cl. 350—170 14 Claims



1. A refractive optical system for producing multiple beams of light having predetermined angular separations comprising:

means (20, 24, 30, 38) for providing a collimated beam of monochromatic light;

a plurality of optically refractive prisms ($10_1 \ldots 10_{15}$) each providing a predetermined substantially constant angular deviation (δ) between an incident (14) and emergent light beam (12), said prisms being arranged to receive as an incident beam said collimated beam and operable to provide a respective emergent output beam, said plurality of output beams ($12_1 \ldots 12_{15}$) produced thereby defining a pattern of beams determined by the relative angular refractive deviation between said prisms; and

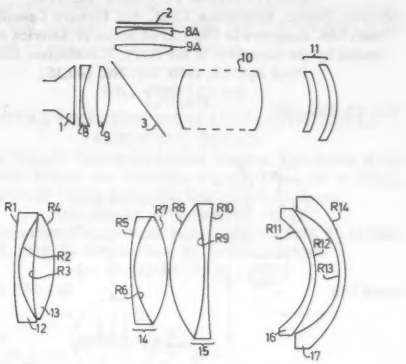
means (44) for mounting said prisms so that they are oriented with respect to said incident beam to provide substantially minimum angular deviation (δ_m), thereby providing an arrangement which is relatively insensitive to translational and rotational changes.

4,350,411
TRANSFER LENS AND HEAD-DOWN DISPLAY USING THE SAME

Philip J. Rogers, Clwyd, Wales, assignor to Pilkington P.E. Limited, Great Britain

Filed Apr. 25, 1980, Ser. No. 143,532
Claims priority, application United Kingdom, May 16, 1979, 7916927
Int. Cl.³ G02B 13/24, 27/10, 9/62; F02B 9/64
U.S. Cl. 350—174 20 Claims

1. A transfer lens comprising a first component which in use is towards the object, the first component being a field-flattening component of negative power which reduces the Petzval sum of the overall lens, a second component of positive power which provides overcorrect astigmatism, a third component of positive power consisting only of a plurality of spaced positive members and which provides most of the power of the overall lens, the third component having undercorrect astigmatism which is corrected by the overcorrect astigmatism of the sec-



ond component, and a fourth component of negative power which increases the field angle of the overall lens.

4,350,412
FRESNEL SPIRAL REFLECTOR AND METHOD FOR MAKING SAME

Richard A. Steenblik, and Dar-Veig Ho, both of Atlanta, Ga., assignors to Georgia Tech Research Institute, Atlanta, Ga.

Filed Apr. 7, 1980, Ser. No. 137,833
Int. Cl.³ G02B 5/08
U.S. Cl. 350—292 29 Claims

2. A method for forming a substantially Fresnel reflector, said method comprising the steps of:

providing a spiral pattern of a predetermined shape on a flat sheet of reflecting material, said shape being such that, when cut and wound, said spiral forms a substantially Fresnel reflector

cutting said flat along said spiral pattern to form a flat spiral of reflecting material; and

winding said spiral about an axis normal to the plane of said flat sheet to a degree sufficient that said spiral defines a desired focal area, whereby said spiral becomes angled to said plane in the radial direction so as to form a substantially Fresnel reflector having said focal area.

13. A substantially Fresnel spiral reflector comprising:

a spiral length of flat reflective material, said spiral length having an inner end and an outer end, one of said ends being fixed and the other of said ends being circumferentially wound up in the direction of said spiral by a predetermined degree, said predetermined degree being such that the turns of said wound spiral define a predetermined focal area

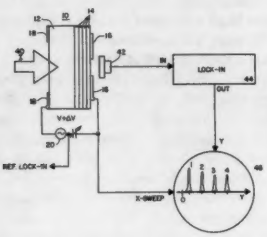
whereby each circumferential portion of said spiral is tilted

in the radial direction from the plane of said spiral to focus light reflected from said spiral onto said focal area.

4,350,413
MULTI-COLOR TUNABLE FILTER

Nicholas Bottka, Ridgecrest, Calif., and Howard Lessoff, Potomac, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 14, 1980, Ser. No. 140,352
Int. Cl.³ G07F *1/03*
U.S. Cl. 350—356 7 Claims

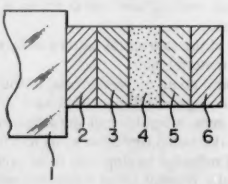


1. A multi-color tunable filter for light comprising:
a substrate in the path of light for transmitting said light;
a plurality of epitaxial layers on said substrate, placed such that said light passes through said plurality of epitaxial layers after passing through said substrate, for filtering selected wavelengths;
means for producing a variable voltage potential across said substrate and epitaxial layers in a predetermined manner;
a detector placed to intercept said light after it has passed through said epitaxial layers for measuring the amount of light that has passed through said substrate and epitaxial layers;
a lock-in set to the predetermined manner in which said voltage varies and electrically connected to said detector for extracting a particular color signal as a function of the change in the output of said detector; and
means for displaying the actual colors present in said light.

4,350,414
ALL SOLID STATE ELECTROCHROMIC DEVICE

Yosuke Takahashi, Sagamihara; Hideki Akasaka, Kawasaki; Toshikatsu Kasui, Tokyo, and Tatsuo Niwa, Kawasaki, all of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Jun. 18, 1980, Ser. No. 160,533
Claims priority, application Japan, Jun. 26, 1979, 54-79626
Int. Cl.³ G02F *1/17*
U.S. Cl. 350—357 5 Claims

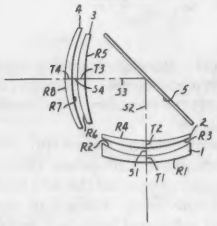


1. An all solid-state electrochromic device, comprising:
a pair of electrodes;
an oxidizable film provided between said electrodes and capable of a redox reaction;
a reducible film provided between said electrodes and capable of a redox reaction; and
an insulating film provided between the above-mentioned films and allowing passage of protons but prohibiting passage of electrons;
wherein said oxidizable film is substantially composed of iridium hydroxide and/or nickel hydroxide, and said reducible film is substantially composed of tungsten oxide and/or molybdenum oxide.

4,350,415
AUXILIARY LENS SYSTEM FOR OVERHEAD PROJECTORS

Lawrence H. Conrad, Maplewood, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Sep. 2, 1980, Ser. No. 183,205
Int. Cl.³ G02B *15/02, 17/00*
U.S. Cl. 350—422 2 Claims

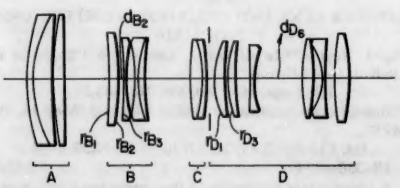


1. Auxiliary lenses for use in conjunction with the projection system in an overhead projector having a pair of converging meniscus lenses angularly positioned with relationship to each other and to a plano reflector, said auxiliary lenses comprising
a first lens positioned adjacent the stage and having negative power and an equivalent focal length of 331.952 mm and radii of curvature for the surfaces of −162.87 mm and −82.2 mm and a thickness of 7.0 mm; and
a second lens positioned adjacent the screen and having a positive power and an equivalent focal length of 1095.75 mm and radii of curvature for the surfaces of +120.60 mm and +97.65 mm and a thickness of 7.0 mm said lenses adapted to be mounted one on each side of the converging meniscus lenses to change the focal length of the system.

4,350,416
COMPACT ZOOM LENS

Shozo Ishiyama, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Japan

Filed Apr. 10, 1980, Ser. No. 138,932
Claims priority, application Japan, Apr. 12, 1979, 54-43591
Int. Cl.³ G02B *15/16*
U.S. Cl. 350—427 6 Claims



1. A compact zoom lens having, in order from the object side, a first positive lens group for focusing, a second negative lens group for variation of focal length, a third positive lens group for compensation of image position, and a fourth positive lens group for imaging, said compact zoom lens being a

mechanical compensation type zoom lens arranged so that said second lens group is moved in the direction of the optical axis for the purpose of varying the focal length and so that the variation of final image position to be caused by the above movement is compensated for by moving said third lens group to form a locus of points concave toward the object side, said first lens group having a two-component, three-element lens configuration with one lens component composed of a positive cemented doublet consisting of a negative lens and a positive lens and the other lens component consisting of a positive lens; said second lens group having a three-component, four-element lens configuration with first, second and third lens components in order from the object side, said first lens component being a positive meniscus lens concave toward the object side, said second lens component being a negative biconcave lens having a concave surface with a small radius of curvature arranged toward the image side, and said third lens component being a negative cemented doublet consisting of a negative biconcave lens and a positive meniscus lens concave toward the image side; said third lens group comprising at least one positive lens; and said compact zoom lens fulfilling the following conditions:

$$-\infty < r_{B1} < -7|f_B|$$

$$-5|f_B| < r_{B2} < -3|f_B|$$

$$-6|f_B| < r_{B3} < -3|f_B|$$

$$d_{B2} < 0.12|f_B|$$

wherein,

r_{Bi} is the radius of curvature of the ith lens surface in said second lens group in order from the object side,

d_{Bi} is the ith distance between lens surfaces in said second lens group in order from the object side, and

f_B is the focal length of said second lens group as a whole.

4,350,417

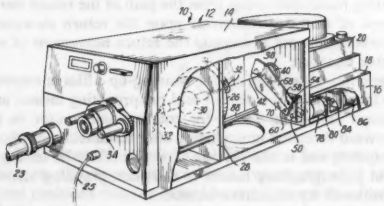
APPARATUS TO CONTROL LIGHT INTENSITY FROM ARC LAMP

Robert S. Freeman, Toledo, Ohio, assignor to Strong Electric Corporation, Toledo, Ohio

Filed Mar. 6, 1981, Ser. No. 241,287

Int. Cl.³ G05D *25/00*; G03B *21/14, 9/02*

U.S. Cl. 353—90 **13 Claims**



1. An apparatus for controlling the light intensity output from an arc lamp comprising displaceable light valve means positionable in the light path of said arc lamp output, the intensity of the light passed along said path by said light valve means being dependent upon the position of said light valve means; magnetically coupled clutch means having an output operatively coupled to said light valve means for controlling the positioning thereof and an input; continuously rotating motor means operatively coupled to said clutch means input; counter-torque means coupled to said magnetic clutch means output for resisting the rotation thereof; and programmer means for selectively applying a control signal to said magnetic clutch means, said magnetic clutch means being adapted to magnetically couple said clutch means input and output to produce a torque, dependent upon said control signal, said torque tending to displace said light valve means at said clutch means output against the resistance of said counter-torque means, whereby said light valve is positioned at a position representative of said control signal, which position is representative of an equilibrium between the output torque transmitted by said magnetic clutch means and the counter-torque produced by said counter-torque means.

4,350,418

CAMERA PROVIDED WITH AUTOMATIC FOCUS ADJUSTING DEVICE

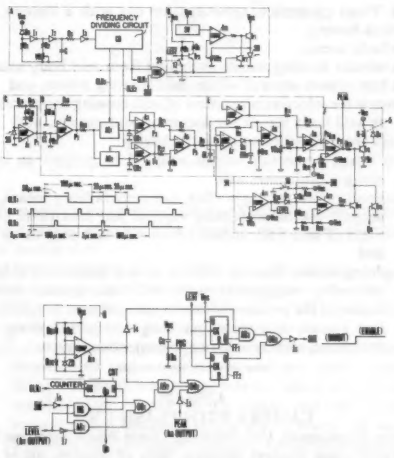
Tetsuya Taguchi, Kawasaki; Shuichi Tamura, Yokohama; Ryuji Tokuda, Tokyo, and Masahiko Ogawa, Hino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1979, Ser. No. 74,313

Claims priority, application Japan, Sep. 14, 1978, 53-113048; Nov. 10, 1978, 53-139144; Nov. 30, 1978, 53-148088

Int. Cl.³ G03B *13/18, 17/40*

U.S. Cl. 354—25 **66 Claims**



1. A camera comprising:

(A) focus adjustable objective lens means for forming an image of an object to be photographed;

(B) automatic focus adjusting means for automatically adjusting the focus of said lens means;

(C) shutter means for exposing film;

(D) shutter release means for releasing said shutter means to operate the shutter means;

(E) trigger means operable for actuating said focus adjusting means;

(F) timer means actuated in synchronism with said focus adjusting means starting a focus adjustment of said lens means for defining a predetermined time and for producing a time count termination signal when said predetermined time has passed;

(F') sequence control means responsive to termination of the focus adjustment of said lens means for producing a focus adjustment completion signal; and

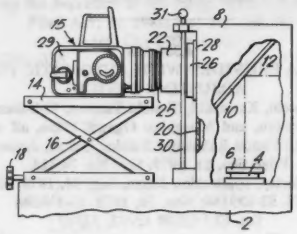
(G) release control means responsive to said focus adjustment completion signal from said sequence control means and said time count termination signal from said timer means for controlling the shutter release operation of said shutter release means in accordance with the logic condition of both of the signals.

4,350,419

FRONT PROJECTION PHOTOGRAPHIC APPARATUS

Kenneth S. Bowen, Hayling Island, England, assignor to Bowens Sales and Service Limited, London, England

Filed Oct. 23, 1980, Ser. No. 199,848
Int. Cl.[3] G03B *35/00, 11/00, 27/32*
U.S. Cl. 354—110 10 Claims



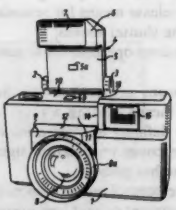
1. Front projection apparatus for use with a camera, said camera having:
a body means,
a tubular housing means extending from said body means,
a lens system secured within said housing means, and
means for selective movement of said housing means relative to said body means for focussing said camera, and
said front projection apparatus having:
an image projection means adapted to project an image along a projection axis,
support means for supporting said camera body means, said support means permitting vertical and horizontal movement of said body means relative to said projection axis, and
sighting means fixed in relation to said projection axis and releasably engageable with said lens system housing means in the position of said housing means in which said lens system axis views an image projected along said projection axis by said image projection means.

4,350,420

CAMERA WITH FLASH UNIT

Dieter Engelsmann, Unterhaching; Dieter Maas, Baldham; Kurt Zattler, and Herbert Schultes, both of Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 17, 1980, Ser. No. 169,927
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1979, 2940301
Int. Cl.[3] G03B *15/05*
U.S. Cl. 354—145 12 Claims



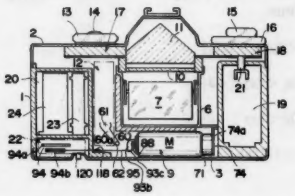
1. In a photographic camera a combination comprising a housing, a flash unit and a projecting lens unit, said housing having an axis which extends perpendicularly of an optical axis of said lens unit and two contiguous sides located in approximately perpendicular planes, said flash unit being of generally L-shaped outline, said flash unit being formed with a supporting part and a head part carrying a reflector, said flash unit being mounted on said housing for pivotal movement between an operative position in which said supporting part projects upwardly of said housing and extends along said housing axis and inoperative position in which at least some surfaces of said supporting part and head part abut against said two contiguous sides in the area of said lens unit and lockingly engage with said sides.

4,350,421

CAMERA WITH A BUILT-IN WINDER

Hiroshi Ueda, Nara, and Shigeru Oyokota, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Azuchi, Japan

Filed Feb. 13, 1981, Ser. No. 234,217
Claims priority, application Japan, Feb. 15, 1980, 55-18005
Int. Cl.[3] G03B *1/18, 17/42, 19/12*
U.S. Cl. 354—152 12 Claims



1. A camera comprising:
a motor rotatable in both forward and reverse directions;
reciprocating means reciprocatable in response to the forward and reverse rotations of said motor;
a charge-type drive mechanism including a drive member engageable by said reciprocating means to move forward therewith upon the forward movement of said reciprocating means, spring means coupled to said drive member to be tensioned by the forward movement of said drive member to store a driving force urging the return movement of said drive member, and photographing means set to a photographing standby position by the forward movement of said drive member and driven from the photographing standby position for effecting photographing by the return movement of said drive member, said reciprocating means retracting from the path of the return movement of said drive member upon the return movement thereof so as not to impede the return movement of said drive member;
a film wind-up mechanism for winding-up a film in response to the return movement of said reciprocating means; and,
a circuit including means for rotating said motor in the forward direction immediately after termination of photographing and in the reverse direction after the setting of said photographing means to the photographing standby positioned by said drive member.

4,350,422

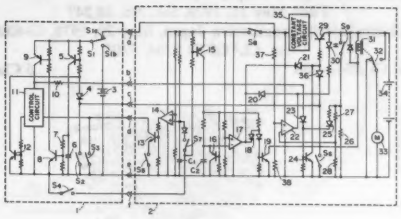
BATTERY CHECKING DEVICE OF A MOTOR DRIVEN CAMERA

Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed May 21, 1981, Ser. No. 266,115
Claims priority, application Japan, May 30, 1980, 55-71494
Int. Cl.[3] G03B *1/18*
U.S. Cl. 354—173 6 Claims

1. A motor driven camera having a power source, a motor connected to said power source and driven by the voltage of said power source, a constant voltage circuit for converting the voltage of said power source into a predetermined constant voltage and putting out the constant voltage, and an electric

circuit connected to said constant voltage circuit and driven by said constant voltage circuit, said camera further having a battery checking device including a discriminating circuit for receiving the output of said constant voltage circuit and the



output of said power source, comparing said two outputs and discriminating whether the voltage of said power source is above a predetermined level, and an indication circuit for receiving the output of said discriminating circuit and indicating the condition of said power source.

4,350,423

STILL CAMERA WITH A RETRACTABLE OBJECTIVE

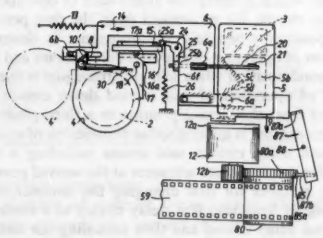
Dieter Engelsmann, Unterhaching; Reinhard Nicko, Munich; Wilfried Bittner, Alxing, and Horst Karl, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 9, 1981, Ser. No. 281,892

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1980, 3028452

Int. Cl.³ G03B *1/12, 13/02, 3/00*

U.S. Cl. 354—173 **13 Claims**



1. A photographic camera, comprising a housing; a viewfinder; an objective displaceable between extended and retracted positions relative to said housing; means for displacing said objective between said extended and retracted positions; film transporting means; and film take-up spool; an electric motor rotatable in two opposite directions and arranged so that when said electric motor rotates in one of said directions it is coupled with said objective displacing means and when said electric motor rotates in the other of said directions it is coupled with said film transporting means and said film take-up spool; switching means for reversing said electric motor; and locking means for said film take-up spool, coupled with said switching means so that when said electric motor is switched for rotation in said one direction for displacing said objective and is coupled with said objective displacing means said film take-up spool is locked against rotation, and when said electric motor is reversed and uncoupled said film take-up spool is released.

4,350,424

CAMERA ASSEMBLY WITH AUTOMATIC WINDING MECHANISM

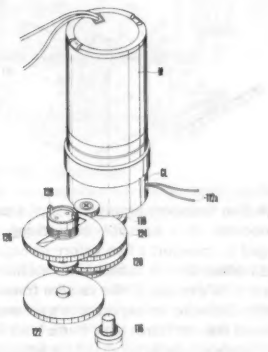
Tomonori Iwashita, Fuchu, and Tadahide Fukushima, Kamakura, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 974,374, Dec. 29, 1978, abandoned. This application Sep. 17, 1981, Ser. No. 303,119

Claims priority, application Japan, Feb. 7, 1978, 53-12747; Feb. 7, 1978, 53-14311[U]

Int. Cl.³ G03B *1/12*

U.S. Cl. 354—173 **9 Claims**



1. A motor drive assembly for a photographic camera comprising a motor operated film winding unit and an electrical power source unit;

said motor operated film winding unit comprising

(a) a base casing defining a mount surface,

(b) a grip member mounted on the side of said base casing, said grip member defining an interior space,

(c) electric motor means and electrically operated clutch means, both said motor means and said clutch means being contained within said interior space of said grip member, said electric motor means and said clutch means having housings which are of about the same diameter, said housings including connecting portions of approximately the same shape and being superposed on each other into one unified body and arranged in the longitudinal direction within the interior space of said grip member,

(d) connecting means having connecting portions of approximately the same shape as the shape of said connecting portions of said motor means and clutch means housings, said connecting portions of said motor means housing and of said clutch means housing being inserted into corresponding connecting portions of said connecting means to form said unified body,

(e) speed reduction means operatively connected to said electrically operated clutch means, with at least part of said speed reduction means being arranged within said base casing, and

(f) film winding coupling means drivingly connected to the output of said speed reduction means and arranged in said base casing to cooperate with said camera;

said electrical power source unit comprising

(g) an attachment casing having an electrical power source contained therein and defining an attachment surface,

(h) first locking means arranged in said attachment surface of said attachment casing corresponding to said mount surface of said winding unit, and

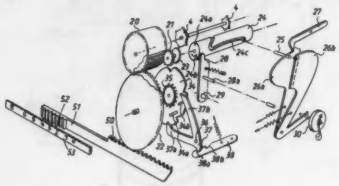
(i) electrical coupling means projecting from said attachment casing.

4,350,425

FILM TRANSPORT ARRANGEMENT FOR A CAMERA

Hubert Hackenberg, Holzkirchen, Fed. Rep. of Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 4, 1981, Ser. No. 260,281
Claims priority, application Fed. Rep. of Germany, May 29, 1980, 3020396
Int. Cl.³ G03B 1/24
U.S. Cl. 354—207 6 Claims



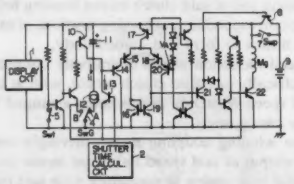
1. A film transport arrangement of a camera for a film accommodated in a cassette, comprising transporting means arranged to transport a film before its exposure in a first transport direction from a cassette into a film receiving space of a camera to be exposed in the camera frame after frame, and to move the film after its exposure in a second transport direction in stepped manner frame after frame back into the cassette; and a film transport handle arranged for acting upon said transporting means so as to move the film in both directions, said film transport handle being formed as a transport slider which is displaceable in two displacement directions and has a stroke of displacement in one of said displacement directions sufficient to transport the entire film length in a respective one of said transport directions.

4,350,426

TIME DETERMINATION CIRCUIT FOR CAMERA

Shinji Urata, Tachikawa, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1981, Ser. No. 240,423
Claims priority, application Japan, Mar. 12, 1980, 55-32412[U]
Int. Cl.³ G03B 7/26
U.S. Cl. 354—234 6 Claims



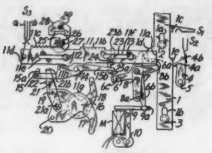
1. A time determination circuit for a camera comprising: power maintaining time determination circuit means for supplying operating power to exposure conditions determining means prior to a shutter opening operation; shutter controlling time determination circuit means; and a single capacitor coupled as a time determination capacitor to both said power maintaining time determination circuit means and said shutter controlling time determination circuit means.

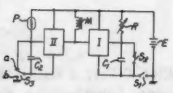
4,350,427

ELECTROMAGNETIC SHUTTER RELEASE DEVICE FOR CAMERAS

Kiyoshi Kitai; Yukio Morino; Shogo Kato, and Masanori Watanabe, all of Shikawatashi, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1979, Ser. No. 38,247
Claims priority, application Japan, May 29, 1978, 53-63974
Int. Cl.³ G03B 9/64, 7/08
U.S. Cl. 354—238 6 Claims





1. An electromagnetic shutter release device for use in taking an exposure comprising: a first delay circuit energized in response to initiation of the shutter release operation; a second delay circuit energized in response to initiation of the exposure operation; an electromagnet connected to said first and second delay circuits for energization in response to energization of said first and second delay circuits; an armature; means mounting the armature for movement to a first position by said electromagnet which is energized at the start of operation of said first delay circuit, for movement from the first position to a second position when said electromagnet is denergized at completion of operation of said first delay circuit and attracted at the second position when said electromagnet is energized at the start of operation of said second delay circuit, and for movement from the second position to a third position when said electromagnet is denergized at completion of operation of said second delay circuit, said means including a detaining member for detaining said armature at the second position, and a driving member for first changing the connection of said electromagnet from said first delay circuit to a connection to said second delay circuit and then canceling the detaining of said armature by said detaining member while starting the exposure operation; and wherein said driving member is started by the movement of said armature from said first position to said second position, and the aperture closing operation is started by the movement of said armature from said second position to said third position.

4,350,428

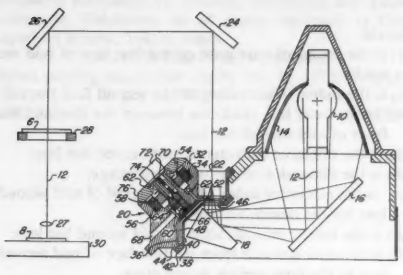
SHUTTER MECHANISM

Edward H. Phillips, Mountain View, Calif., assignor to Optimetrix Corporation, Mountain View, Calif.

Filed Oct. 9, 1979, Ser. No. 82,484
Int. Cl.³ G03B 9/10
U.S. Cl. 354—254 14 Claims

1. A shutter mechanism comprising:
a housing having a shutter aperture;
a shutter rotatably mounted within the housing for opening and closing the shutter aperture; and
drive means, coupled to the shutter, for unidirectionally rotating the shutter during each exposure period between

an initial rest position and a final rest position with a variable velocity profile controlled with respect to shutter



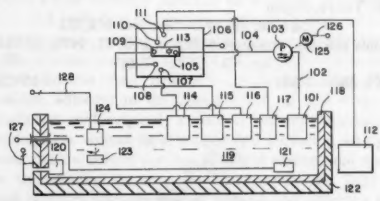
position to open the shutter aperture and with a matching variable velocity profile also controlled with respect to shutter position to close the shutter aperture.

4,350,429

MATERIAL PROCESSING APPARATUS

James A. Slavin, East Windsor, N.J., assignor to Noltac Corp., Jericho, N.Y.

Filed Feb. 22, 1980, Ser. No. 123,853
Int. Cl.³ G03B *3/06*; F16K *11/06*
U.S. Cl. 354—299 **41 Claims**



1. Apparatus, comprising

(a) a plurality of material storage tanks, each adapted to contain a supply of a respective material,

(b) selector valve means having a first port and a plurality of second ports and means for establishing a connection between said first port and any one of said second ports,

(c) drive means connected to said selector valve means for actuating said valve to connect said first port to any one of said second ports,

(d) conduit means connecting said storage tanks to respective ones of said second ports,

(e) further conduit means connected to carry materials to a processing container,

(f) a material conveyance means connected between said first port and said further conduit means,

(g) means connected to said drive means for selecting one of said second ports for connection to said first port,

(h) temperature control bath containing at least one of said material storage tanks, and

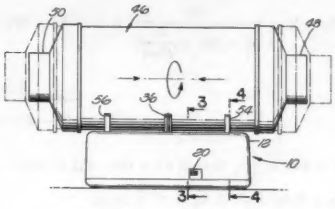
(i) means for preventing operation of said material conveyance means except when said selector valve has established a connection between said first port and a selected one of said second ports.

4,350,430

MOTOR DRIVE DESIGN

Ronald M. Johnson, Pasadena, Calif., assignor to Dev Tec Resources, Inc., Pasadena, Calif.

Filed Jan. 16, 1981, Ser. No. 225,638
Int. Cl.³ G03D *3/04*
U.S. Cl. 354—330 **4 Claims**



1. A motor drive unit comprising:

a base member, said base member having an upper surface,

a drive wheel extending from said upper surface which is in operative relationship to a drive motor,

a drive motor,

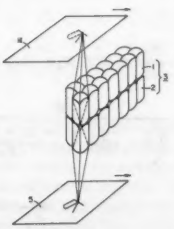
said upper surface of said base member also carrying a pair of spaced apart undriven wheels which are rotatable in planes parallel to the plane of rotation of said drive wheel, said base member being adapted to receive a cylindrical processing drum for containing photograph film and liquid processing chemicals for the film by 3-point contact on the surfaces of said wheels whereby said drum is free to move longitudinally with respect to said base until said drum has leveled itself to uniformly distribute liquid processing chemicals over the length of the interior of said drum.

4,350,431

PROJECTING DEVICE

Noritaka Mochizuki, Yokohama; Setsuo Minami, Kawasaki; Yoshiya Matsui, Yokohama; Atsuo Tsunoda, Fuchu; Koyo Midorikawa, Tokyo; Hidetoshi Murase, Yokohama; Mikio Suzuta, and Masazumi Moriwaki, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1980, Ser. No. 166,849
Claims priority, application Japan, Jul. 13, 1979, 54/89109; Jul. 13, 1979, 54/89110
Int. Cl.³ G03B *27/00, 27/44*
U.S. Cl. 355—1 **10 Claims**



1. A projecting device, comprising:

a plurality of element lens systems each adapted for imaging a part of an object as part of a corresponding projected image and each comprising two bar lenses having axial lengths larger than the effective diameter thereof;

a light absorbing portion provided on the external periphery of each bar lens and adapted for limiting light rays exceeding the effective diameter thereof;

an intermediate ring provided between said two bar lenses in

each element lens system for extracting the effective light beam; and

support members for arranging said plural element lens systems along grooves provided in said support member to form an array of said systems;

wherein a first of said bar lenses satisfies the following conditions:

$$K_1 \times (n'_1 - 1) \times \frac{\beta_1 S_1}{(1-\beta_1) - \frac{S_2}{\beta_1 S_1}} \leqq r_1 \leqq K_2 \times (n'_1 - 1) \times \frac{\beta_1 S_1}{(1-\beta_1) - \frac{S_2}{\beta_1 S_1}};$$

$$K_2 \times (1 - n'_1) \times \beta_1 S_1 \leqq r_2 \leqq K_1 \times (1 - n'_1) \times \beta_1 S_1;$$

$$K_1 \times n'_1 \times \beta_1 S_1 \leqq d'_1 \leqq K_2 \times n'_1 \times \beta_1 S_1;$$

$$K_1 \times \frac{-S_1/Fe}{1-\left(\frac{1}{2Fe}\right)^2} \leqq \phi_1 \leqq K_2 \times \frac{-S_1/Fe}{1-\left(\frac{1}{2Fe}\right)^2}; \text{ and}$$

$$K_1 \times \frac{\frac{S'_2}{\beta_1} - S_1}{\beta_1 S_1} \times \phi_1 \leqq \phi_0 \leqq K_2 \times \frac{\frac{S'_2}{\beta_1} - S_1}{\beta_1 S_1} \times \phi_1;$$

wherein:

r_1 is the radius of curvature of the first face of said first bar lens;

r_2 is the radius of curvatuve of the second face thereof;

d_1' is the axial lens thickness between the first and second faces of said first bar lens;

ϕ_1 is the effective diameter thereof;

ϕ_0 is the dimension of the object;

n_1' is the refractive index of the material of said first bar lens for the design wavelength;

β_1 is the lateral magnification of said first bar lens;

S_1 is the axial distance from the first face of said first bar lens to the object plane;

S_2' is the axial distance from the second face of said first bar lens to the intermediate image plane;

Fe is the effective F-number at the object field side;

K_1 is 0.9 and

K_2 is 1.1; and

wherein the second bar lens satisfies the following conditions:

$$K_1 \times (1 - n'_2) \times \frac{S'_4}{\beta_2} \leqq r_3 \leqq K_2 \times (1 - n'_2) \times \frac{S'_4}{\beta_2};$$

$$K_2 \times (n'_2 - 1) \times \frac{S'_4/\beta_2}{\left(1 - \frac{1}{\beta_2}\right) - \frac{S_3 \times \beta_2}{S'_4}} \leqq r_4 \leqq K_1 \times (n'_2 - 1) \times \frac{S'_4/\beta_2}{\left(1 - \frac{1}{\beta_2}\right) - \frac{S_3 \times \beta_2}{S'_4}};$$

$$-K_1 \times n'_2 \times S'_4/\beta_2 \leqq d'_2 \leqq -K_2 \times n'_2 \times S'_4/\beta_2;$$

$$K_1 \times \frac{S'_4/Fe'}{\sqrt{1-\left(\frac{1}{2Fe'}\right)^2}} \leqq \phi_3 \leqq K_2 \times \frac{S'_4/Fe'}{\sqrt{1-\left(\frac{1}{2Fe'}\right)^2}};$$

and

-continued

$$K_1 \times \phi_3 \times \frac{S_3\beta_2 - S'_4}{S'_4/\beta_2} \leqq \phi_4 \leqq K_2 \times \phi_3 \times \frac{S_3\beta_2 - S'_4}{S'_4/\beta_2};$$

wherein:

r_3 is the radius of curvature of the first face of said second bar lens;

r_4 is the radius of curvature of the second face thereof;

d_2' is the axial lens thickness between the first and second faces of said second bar lens;

ϕ_3 is the effective diameter of said second bar lens;

ϕ_4 is the dimension of the projected image;

n_2' is the refractive index of the material of said second bar lens for the design wavelength;

β_2 is the lateral magnification of said second bar lens;

S_2 is the axial distance from the first face of said second bar lens to the intermediate image plane;

S_4' is the axial distance from the second face of said second bar lens to the projection plane;

Fe' is the effective F-number at the image field side;

K_1 is 0.9, and

K_2 is 1.1

4,350,432

DEVELOPMENT APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES

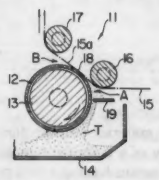
Shiroh Kondoh, Sagamihara, Japan, assignor to Ricoh Company Ltd., Tokyo, Japan

Filed Dec. 12, 1979, Ser. No. 102,782

Claims priority, application Japan, Feb. 21, 1979, 54-19450

Int. Cl.³ G03G *21/00*

U.S. Cl. 355—3 DD **15 Claims**



1. An apparatus for developing electrostatic latent images formed on an image bearing member movable past a development zone, including a container for holding a supply of magnetically attractible developer, and developing means for transporting said developer from said container to said development zone and forming with said image bearing member a space for accumulating developer held in contact with said member, said developer accumulating in said space being movable relative said image bearing member by movement of said member whereby the amount of developer brought into contact with said image bearing member will depend upon the movement of said member through said development zone, said means including a non-magnetic sleeve engaging developer in said container and located adjacent said development zone, a magnetized device disposed within said sleeve and drive means for providing relative movement between said magnetized device and said sleeve.

4,350,433
SCANNING ILLUMINATOR

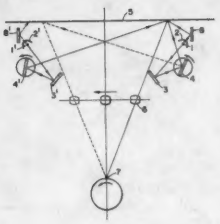
Susumu Seto, Odawara; Mitsuhiro Tokuhara, Chigasaki; Yukio Takemura, Kawasaki; Yu Yamada, Kokubunji, and Takeshi Kuwayama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

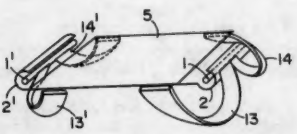
Filed Jul. 9, 1981, Ser. No. 281,880

Claims priority, application Japan, Jul. 24, 1980, 55-101505

Int. Cl.³ G03G *15/28*

U.S. Cl. 355—8 **6 Claims**





6. An illuminator comprising a first source of light fixed at a position adjacent to one end of an original for illuminating said original; a first reflector partially surrounding said first light source and including an opening formed therein behind said first light source; a first light transmitting member for transmitting the illuminating light beam passed through said opening to said one end area of said original; a second light source fixed at a position adjacent to the opposite end of said original for illuminating said original; a second reflector partially surrounding said second light source and including an opening formed therein behind said second light source; and a second light transmitting member for transmitting the light beam passed through said opening in said second reflector to said opposite end area of said original.

4,350,434
ELECTROPHOTOGRAPHIC COPYING MACHINE

Rudolf Paulus; Norbert Schankat, both of Munich; Manfred Weinzierl, Pfaffenhofen, and Walter Franke, Bad Aibling, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

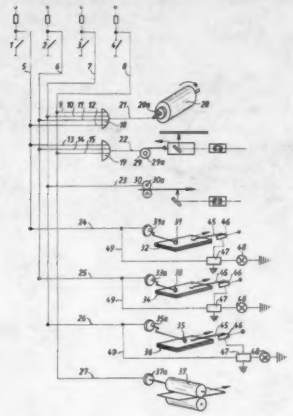
Filed Oct. 4, 1978, Ser. No. 948,325

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1977, 2746991

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 SH **14 Claims**

1. In a copying machine of the type having two or more infeed capabilities and control means activatable for implementing the respective infeed capabilities, an arrangement for selecting the infeed capability to be utilized, the arrangement comprising a plurality of operator-activated dual-purpose select-and-start switches each associated with a respective infeed capability and means responsive to activation of each operator-activated select-and-start switch for activating the respective control means and also initiating copying, whereby when the operator selects the infeed capability to be utilized he



simultaneously commands initiation of copying and therefore need not activate a second switch merely to initiate copying.

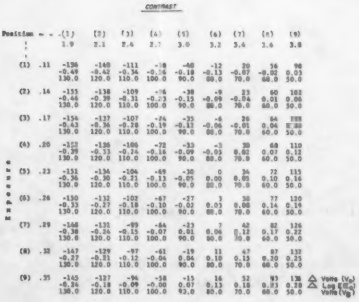
4,350,435
COPY CONTRAST AND DENSITY CONTROL

John M. Fiske, Rochester, and Richard Velzen, Kodak Park, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 4, 1980, Ser. No. 137,149

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 C **8 Claims**



1. Copy solid area, contrast and density adjusting apparatus for use in a copier having a chargeable photoconductor, adjustable charging means for varying the voltage Vo applied onto the photoconductor, an adjustable exposure station for varying the copier exposure Eo, and a development station having at least one electrode and adjustable bias means for applying an adjustable bias voltage V_B to said electrode for establishing a bias voltage between the photoconductor and said development station to affect copy solid area density; said apparatus comprising:

(a) memory means having stored therein a matrix of sets of representations of interrelated electrical values, with each such set having values which correspond to specific levels of Vo, Eo, and V_B that define a particular solid area copier Din/Dout response curve with a predetermined breakpoint;

(b) means for addressing said matrix to designate a particular set; and

(c) logic and control means responsive to the values of said designated set to adjust said adjustable charging means, said adjustable bias means and said adjustable exposure station to produce copies in accordance with the Din/Dout response curve defined by such designated set values.

4,350,436

FEED CONTROL DEVICE

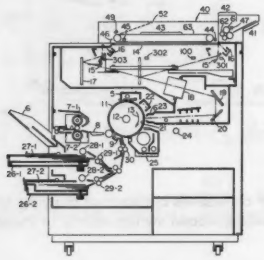
Toshiaki Yagasaki, Hino; Shunichi Masuda, Wakabaya; Katsuichi Shimizu, Kunitachi, and Hisashi Sakamaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

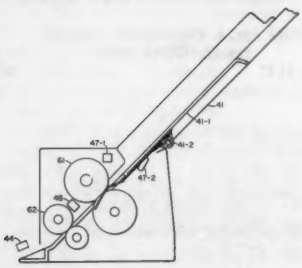
Filed May 20, 1980, Ser. No. 151,673

Claims priority, application Japan, May 25, 1979, 54-64807

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 SH **5 Claims**





1. A feed control device comprising:

means for feeding sheet mediums to a predetermined position;

control means for de-energizing the driving force to said feed means, while a sheet medium is engaged therein, wherein inertia forces of the feed means complete the feed of said sheet medium.

4,350,437

APPARATUS AND METHOD FOR PRODUCING IMAGES OF VARIOUS SIZES ON PHOTOSENSITIVE FILM

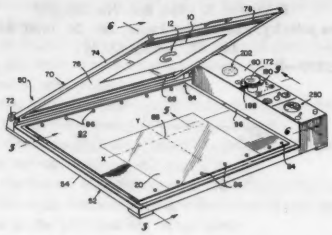
Charles E. Fishburn, Indianapolis, Ind., assignor to National Printing Plate Company, Inc., Indianapolis, Ind.

Filed Oct. 21, 1980, Ser. No. 199,285

Int. Cl.³ G03B *27/68*

U.S. Cl. 355—52 **22 Claims**

1. An apparatus for producing images of various sizes on photosensitive film, comprising a base, a platform movable relative to the base for supporting one of a photosensitive film and a photographic image in a plane in fixed proximal relationship to the other of the photosensitive film and photographic image to expose a portion of the film to a light source to produce an image on the film of generally the same size as the photographic image, a control arm for carrying the platform in fixed relationship thereto, a resilient control linkage interconnecting the control arm and the base to allow random movement of the control arm and platform, moving means for randomly moving the control arm to randomly move the platform to expose a greater portion of the film to the light source to



vary the size of the image produced on the film, and adjustable control means for limiting the random movement of the platform to define its path of movement and to selectively determine its degree of movement.

4,350,438

LIGHT DOSING DEVICE

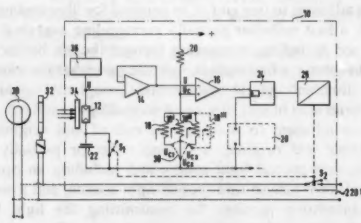
Herbert Schröter, Taunusstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 31, 1977, Ser. No. 801,734

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2624866

Int. Cl.³ G03B *27/72*

U.S. Cl. 355—68 **4 Claims**



1. A device for dosing light from a light source in accordance with the intensity of light impinging upon a material to be exposed, comprising:

a photoresistor located in the beam path of the light source and controlling the exposure time in accordance with the intensity of the light impinging upon the material;

a capacitor bridged by a first switch and starting to be charged when the light source is switched on;

said photoresistor having an ohmic resistance inversely proportional to the intensity of the light impinging thereon and providing an output voltage, said photoresistor stationarily arranged in the beam path of said light source and, together with the capacitor, connected in series to form an RC-circuit;

a switching element for varying the exposure times and connected in series with the photoresistor;

amplifying means having an input and providing an amplified output voltage;

means for connecting the juncture of said photoresistor and said switching element to the input of said amplifying means;

said switching element being triggered with an adjustable frequency and/or pulse width discontinously extending

the period of time during which the capacitor is charged by exposure;

means responsive to switching-on of the light source for initiating charging of the capacitor;

means for comparing the amplified output voltage of said photoresistor with a reference voltage and producing an output signal when said amplified output voltage is equal to said reference voltage; and

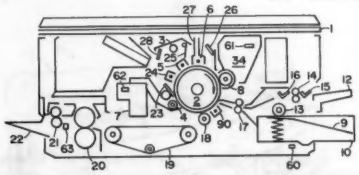
means for controlling the length of time for which the light of the light source is impinging upon the material, said means including a diaphragm positioned between the light source and the material to be exposed and means for opening and closing said diaphragm in response to said output signal from said comparing means;

whereby the exposure times of said material to be exposed can be varied by a predetermined ratio to produce a desired shade of gray.

4,350,439
COPYING APPARATUS

Hiroshi Tanioka, Tokyo; Masato Ishida, Kawasaki, and Tsuneki Inuzuka, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1980, Ser. No. 213,593
Claims priority, application Japan, Dec. 13, 1979, 54/161870
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 SH **10 Claims**



1. Copying apparatus comprising:

means for forming a reproduced image of an original on a copy material, said image forming means comprising a rotary member forming a transferred image on said copy material and means for repeatedly supplying said copy material to a transfer station;

means for entering data necessary for image formation, said data entering means comprising instruction means for selecting the position of the reproduced image on said copy material;

means for performing timing control said image forming means for image formation in response to the data entered by said data entering means, said timing control means comprising feed control means provided with switching means to be actuated by said image forming means and timer means associated with said switch means, and timer control means for controlling operation of said timer means for shifting feed timing of said feed control means in response to the instruction data supplied from said instruction means; and

means for displaying feed timing of said feed means.

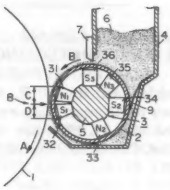
4,350,440
DEVELOPING APPARATUS

Tsuyoshi Watanabe, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1980, Ser. No. 167,194
Claims priority, application Japan, Jul. 16, 1979, 54/91161
Int. Cl.³ G03G *15/09*
U.S. Cl. 355—3 DD **7 Claims**

1. A developing apparatus for developing a latent image by applying a one component magnetic developing agent to the latent image provided on a latent image bearing member, comprising:

a rotatable developing agent carrying member of non-magnetic material for carrying on its surface the one component magnetic developing agent, means for supplying the developing agent to the developing agent bearing member, magnetic field generating means disposed within said developing agent carrying member, said magnetic field generating means having a developing magnetic pole for effecting development in a developing zone and a magnetic pole, having a polarity opposite to that of said developing magnetic pole, for removing fog by transferring the

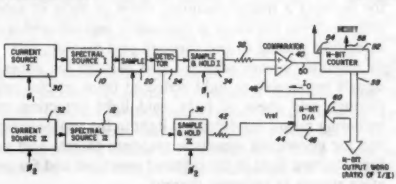


developing agent that has been deposited on the non-image area of the latent image bearing member back to said developing agent carrying body, means for defining a gap between the surface of the developing agent layer on said developing agent carrying member surface and the latent image bearing member across which the developing agent flies to develop the latent image, means for applying an alternating developing bias electric field across said gap, and regulating means for regulating the quantity of developing agent on the surface of said developing agent carrying member to regulate the thickness of the developing agent layer to be smaller than said gap.

4,350,441
PHOTOMETRIC APPARATUS AND METHOD

Michael F. Wicnienski, Antioch, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 30, 1980, Ser. No. 164,357
Int. Cl.³ G01N *33/48, 21/31*
U.S. Cl. 356—40 **15 Claims**



1. A photometric apparatus for determining the absorbance ratio in a sample of two different wavelength lights, said apparatus comprising:

means for providing a light of a first wavelength having, when said light is energized, a postsample intensity after said light is directed through the sample;

means for providing a light of a second wavelength having, when said light is energized, a postsample intensity after said light is directed through the sample;

means for alternately energizing said first and second lights;

means for detecting said postsample intensities of said first and second lights;

a comparator having two inputs and an output;

a digital to analog converter having two inputs and an output;

means coupling the output of said digital to analog converter to an input of said comparator;

means coupled to the other input of said comparator for providing a signal that is proportional to said detected postsample intensity of said first light;

means coupled to an input of said digital to analog converter for providing a signal that is proportional to said detected postsample intensity of said second light;

an up/down counter having an up/down input and an output;

means coupling the output of the comparator to the up/-down input of said counter;

means coupling the output of the up/down counter to the other input of said digital to analog converter; and

means for clocking said up/down counter.

4,350,442

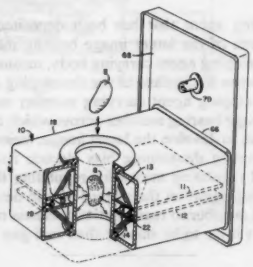
LIGHT AND COLOR DETECTING SCANNER FOR A SORTING APPARATUS

Tor Arild, Woodside, and Russell R. Ames, San Jose, both of Calif., assignors to Accusort Corporation, Belmont, Calif.

Filed May 19, 1976, Ser. No. 687,950

Int. Cl.[2] G01J *3/5;* G01N *21/26*

U.S. Cl. 356—51 **24 Claims**



1. In apparatus for sorting articles, an optical scanner comprising the combination of:

means defining a passage through which said articles may pass,

illuminating means substantially surrounding said passage for forming a multidirectional sheet of light of substantially uniform thickness in the visible and infrared spectra extending normal to and through said passage, and

light detecting means adjacent said passage for generating signals responsive to light reflected from articles passing through said sheet of light, said light detecting means including means for detecting light in the visible spectrum and for generating signals in response thereto and means for detecting light in the infrared spectrum and for generating signals in response thereto.

4,350,443

OPTICAL FRINGE ANALYSIS

Tommy L. Williamson, Centerville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 24, 1980, Ser. No. 162,555

Int. Cl.[3] G01B *11/00;* G02B *5/32*

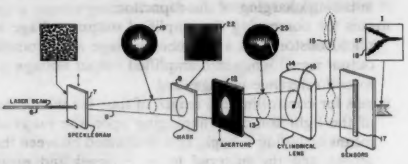
U.S. Cl. 356—358 **7 Claims**

1. An apparatus for measuring surface displacement using specklegram interferometry, comprising:

a means for generating a two-dimensional specklegram interference pattern in a coherent light beam;

a mask means for correlating spatial frequencies in the interference pattern with a pattern of known composition positioned in the path of the patterned beam;

a means for optically integrating the correlated pattern, along lines of constant spatial frequency, to generate a single varying intensity; and



a means for incrementally sensing light intensity along the length of the line formed by the optical integration.

4,350,444

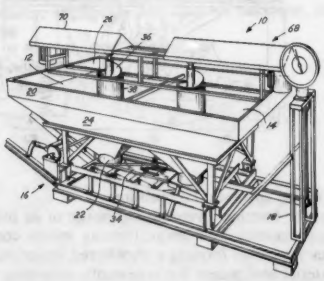
APPARATUS FOR MIXING MATERIALS SUCH AS FERTILIZER COMPONENTS

Lloyd A. Yargus, R.R. #2, Marshall, Ill. 62441; Lester W. Switzer, Sr., Marshall, Ill.; Gary N. Allen, Martinsville, Ill.; Gary S. Elliott, Cropsey, Ill.; Larry D. Yargus, 402 N. 7th St., Marshall, Ill. 62441; William D. Lowry, Martinsville, Ill.; Jeffrey M. Gosnell, Marshall, Ill., and Darrell J. Spires, Marshall, Ill., assignors to Lloyd A. Yargus and Larry D. Yargus, both of Marshall, Ill.

Filed Nov. 12, 1980, Ser. No. 205,919

Int. Cl.[3] B01F *7/24*

U.S. Cl. 366—141 **9 Claims**



1. An apparatus for mixing at least a first and second material to provide a mixture thereof comprising, in combination:

at least one hopper having an upper loading port, a lower discharge port, an inclined sidewall converging towards said discharge port, and a central region therein, said first and second materials being loaded into said hopper through said upper loading port and discharged from said hopper through said lower discharge port;

frame means for supporting said hopper in a substantially upright position;

an auger drivably mounted in said central region of said hopper, said auger being substantially vertical and extending substantially through said hopper;

a housing substantially enclosing said auger, said housing having an upper opening and a lower opening and defining a mixing chamber about said auger, said auger drawing said first and second materials into said mixing chamber through said lower opening, rotatably mixing said first and second materials therein, and discharging said first and second materials from said mixing chamber into said hopper through said upper opening;

a baffle secured to said housing, said baffle divergingly extending towards said lower discharge port of said hopper;

drive means for controllably driving said auger;

gate means for controllably closing said lower discharge port; and

roof means for substantially directing said first and second materials towards said baffle during loading of said hopper;

said inclined sidewall of said hopper, said baffle attached to said housing and said roof means cooperatively defining blender means for pre-mixing said first and second materials prior to mixing thereof in said mixing chamber and for providing a blending flow pattern as said first and second materials flow through said hopper.

4,350,445

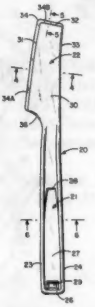
PADDLE

Sven O. Olsson, 7019 Kerry Rd., Edina, Minn. 55435

Filed Dec. 15, 1980, Ser. No. 216,774

Int. Cl.³ B01F *13/00*

U.S. Cl. 366—343 **9 Claims**



1. A paddle usable for stirring a fluid, comprising:

an elongate linear handle having generally parallel side edges adapted to be grasped by an user for manipulation of the paddle;

a blade connected to the handle having a blade base with a width greater than the transverse dimension of the handle, said blade base having a relatively blunt trailing side edge substantially linear with one side edge of the handle, and a leading side edge offset from the handle and angularly orientated relative to the trailing side edge in diverging relationship to the handle and a leading end edge orientated in generally perpendicular relationship to the leading side edge;

an uninterrupted narrow resilient wiper lip extended from the leading side edge of the base and the leading end edge of the base adapted for surface engagement of a surface to move fluid away from the surface.

4,350,446

METHOD AND APPARATUS FOR CALORIMETRIC DIFFERENTIAL THERMAL ANALYSIS

Robert C. Johnson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 3, 1980, Ser. No. 203,639

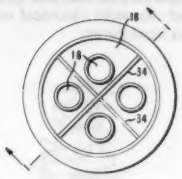
Int. Cl.³ G01K *17/00*

U.S. Cl. 374—13 **15 Claims**

1. A cell for use in a differential scanning calorimeter comprising:

a unitary thermally conductive sheet formed of a material capable of forming a junction of a thermocouple and fabricated to provide a plurality of thermal test positions, at least one of said test positions being thermally connected with all other test positions by equivalent thermal paths of said sheet,

a heat source having portions contacting said sheet to transfer heat between said source and each of said test positions through thermally equivalent paths in said sheet, and



means for forming with said sheet a thermocouple at each of said positions for measuring the relative temperatures at each position.

4,350,447

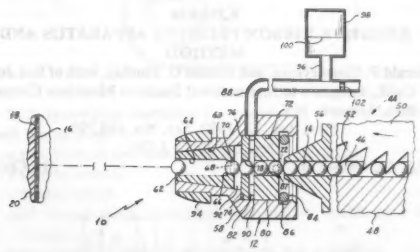
SYNCHRONIZING SYSTEM FOR RAPID-FIRE GUN IN A MICROBALLISTIC PRINTER OR THE LIKE

Benzion Landa, Alberta, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Continuation of Ser. No. 85,688, Oct. 17, 1979, abandoned. This application Sep. 23, 1981, Ser. No. 304,781

Int. Cl.³ B41J *3/02*

U.S. Cl. 400—118 **13 Claims**



13. An impact printer for producing an intelligible pattern on a print-receiving medium including in combination means for supporting said medium, means for successively firing solid projectiles toward said medium from a location spaced therefrom, means for sensing the firing of a first projectile by said firing means, and means for repositioning said firing means to propel a second projectile immediately following said first projectile toward a predetermined point on said medium forming part of said pattern, said repositioning means being responsive to said sensing means to reposition said firing means only upon sensing of the firing of said first projectile therefrom.

4,350,448

PRINTING HEAD MOUNTING DEVICE

Takayoshi Hanagata, and Atsushi Noda, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1980, Ser. No. 149,452

Claims priority, application Japan, May 29, 1979, 54/67158

Int. Cl.³ B41J *3/20*

U.S. Cl. 400—120 **3 Claims**

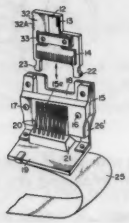
1. A printing head mounting device comprising:

head means having at least one groove formed in each side surface of said head means and integrally holding a heating member with a pattern of electrical contacts to supply an electrical signal to said heating member;

a connector body for removably holding said head means in a direction substantially vertical to a direction of movement of said head means when said means prints a line of characters with the direction of said head means deter-

mined when a bottom surface of said head means is held on a bottom surface of said connector body;

a plurality of electrically conductive contact pieces held at accurate positions by at least one groove formed in said connector body to make electrical connection with said pattern of said head means;



a plurality of rotatable members fitting in the grooves of said head means and pressing a bottom surface of said head means against a bottom surface of said connector body; and;

a resilient member for biasing said plurality of rotatable members towards each other and in a direction substantially parallel to the direction of movement of said head means.

4,350,449

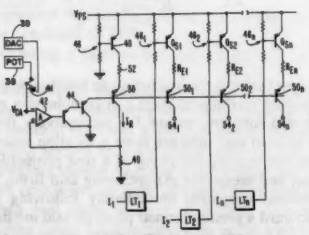
RESISTIVE RIBBON PRINTING APPARATUS AND METHOD

Gerald P. Countryman, and Ronald G. Findlay, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 23, 1980, Ser. No. 162,295

Int. Cl.³ B41J *3/20*

U.S. Cl. 400—120 **11 Claims**



6. Apparatus for marking a record medium comprising:

a transfer medium consisting of a resistive layer, a conductive layer and a thermally transferrable marking material layer;

a print head comprising a plurality of spaced printing electrodes disposed in close proximity to said transfer medium;

means for interposing the transfer medium between the record medium and the print head with the resistive layer adjacent the print head; and

means for selectively energizing said printing electrodes to cause current of a constant predetermined magnitude to flow between each selected print electrode and said conductive layer to generate resistance heating in the resistive layer and thereby heat the adjacent localized area of said marking material layer for causing transfer of marking material from the marking material layer to the record medium such that uniform marking can be effected regardless of the number of electrodes simultaneously selectively energized and regardless of the difference in contact resistance between said printing electrodes and said transfer medium.

4,350,450

STYLUS PRINTING HEAD COMPRISING ELECTROMAGNETS ON RESILIENT SUPPORTS

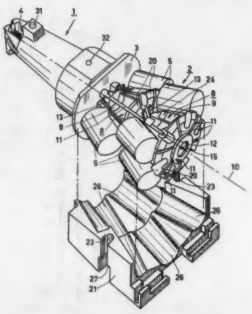
Heinrich Dürr, Wilnsdorf; Hermann Richter, Freudenberg; Wendelin Weber; Burkhard Goerke, both of Siegen, and Peter Engler, Wilnsdorf, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 22, 1980, Ser. No. 189,970

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1979, 2939885

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **4 Claims**



1. A stylus printing head, comprising cylindrical electromagnets which are circularly arranged around a central axis and which operate the printing styli, said electromagnets being accomodated in cradle-shaped supports of at least one conical carrier, characterized in that the cradle-shaped supports are resilient, that electromagnets being mounted under a substantially radial spring force in the cradle-shaped supports by means of a cover which is common to all electromagnets mounted on the said carrier, each electromagnet being locked against sliding in its longitudinal direction by way of two protrusions, at least one of which is flexible, each of said electromagnets being detachable in its entirety from the cooperating cradle-shaped support by movement in a plane which is perpendicular to the cylinder axis.

4,350,451

SLIDABLY POSITIONABLE CARTRIDGE HAVING SKEWED RIBBON FEED

Edward D. Furrow, Crimora, Va., assignor to General Electric Company, Waynesboro, Va.

Filed Feb. 14, 1980, Ser. No. 121,607

Int. Cl.³ B41J *33/14*

U.S. Cl. 400—208 **25 Claims**

1. An inked ribbon supply arrangement for a printing apparatus comprising:

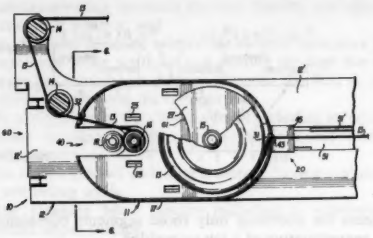
a ribbon cartridge, said cartridge comprising a housing;

a ribbon dispensing spool and a ribbon takeup spool rotatably supported in said housing on spaced axes;

an inked ribbon wound on said dispensing spool, exiting said housing at one location and re-entering said housing at a second location, and having an end attached for winding on said takeup spool;

a rotatable member extending into said cartridge housing through an aperture at a third location in driving engage-

ment with said ribbon on said takeup spool for rotating said takeup spool thereby to wind said ribbon thereon; and



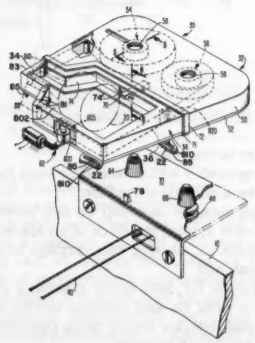
means for moving said cartridge longitudinally as a function of the diameter of inked ribbon being wound up on said takeup spool.

4,350,452

RIBBON LOADING SYSTEM FOR A TYPEWRITER OR THE LIKE USING A SIDEMOUNTED RIBBON CARTRIDGE HAVING A DETACHABLE RIBBON GUIDE

Edward N. Dials, Versailles, and Drew A. Kightlinger, Lexington, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1980, Ser. No. 136,003
Int. Cl.³ B41J *33/14*
U.S. Cl. 400—208 **4 Claims**



1. A ribbon system for use with a printer that includes a printhead supported on a carrier that is moveable along a carrier path between two terminal positions, one in a forward direction for printing and the other in the reverse direction for printing, said system comprising:

a cartridge that includes a length of ribbon and a cover section for generally enclosing said ribbon, there being an output side of said cover section through which a loop of said ribbon extends;

a cartridge holder that is aligned with said carrier path and located adjacent one selected terminal position thereof, said cartridge holder including means for releasably retaining said cover section with said output side facing said selected terminal position of said carrier path;

said cartridge further including a frame that is releasably attached at the output side of said cover section and includes ribbon guides that establish a path for said ribbon loop, there being a central opening defined by said frame within said ribbon loop path, which central opening is arranged relative to said cover section to permit said frame to extend onto said carrier and around said printhead when said carrier is at said selected terminal position and said frame is attached to said cover section at said cartridge holder; and

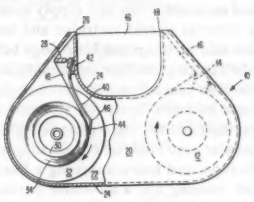
means for releasing said frame from said cover section to permit said frame to move with said printhead.

4,350,453

CARTRIDGE FOR CORRECTION MEDIA OR TACKY TAPE WITH A WRAP SPRING

Thomas R. Field; Peter F. Jagodzinski, both of Lexington; James F. King, Irvine, and John O. Schaefer, Lexington, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 3, 1980, Ser. No. 165,827
Int. Cl.³ B41J *33/14*
U.S. Cl. 400—208 **3 Claims**



1. A typewriter cartridge for containing a tacky adhesive web comprising:

a top, bottom and side walls forming a chamber,

a supply means,

a takeup spool,

said takeup spool supported for rotation within said cartridge,

said side walls forming entrance and exit apertures,

a web extending from said supply means to said takeup spool and through said exit and entrance apertures to form an exposed portion of said web exterior to said cartridge, said web having at least one tacky adhesive surface,

said takeup spool having thereon accumulated convolutions of said web that has been used, including a last convolution, and

beam spring means supported by said cartridge and having a terminal edge, said terminal edge positioned in squeegeeing relation to said convolutions for forcing said web against said accumulated convolutions of said web on said takeup spool, said terminal edge positioned to be the only portion of said beam spring means engaging said web, to remove buckles in said web and said last convolution, said beam spring means formed with a portion of said beam spring means having one end, comprising said terminal edge, bent at an angle to said beam spring means, said beam spring means having a localized reduced cross section comprising the remainder of a cross section of said beam spring means with notches formed in the edges thereof, and

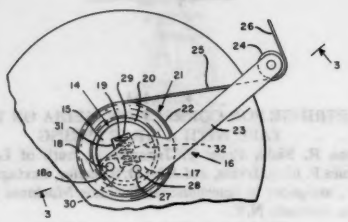
support means for supporting said beam spring means and wherein said reduced cross section is proximate said support means of said cartridge, whereby the bending stress exerted on said beam spring means by said convolutions of said web are concentrated at said reduced cross section and thereby permitting a larger radius in the remaining portion of said beam spring means to insure engagement of said terminal edge with said web in a squeegeeing relation.

4,350,454

RIBBON CARTRIDGE INCLUDING HUB BRAKE

William J. Schoenlein, Levittown, N.Y., assignor to IBM Patent Operations, Lexington, Ky.

Filed Aug. 11, 1980, Ser. No. 176,955
Int. Cl.³ B41J *33/14*
U.S. Cl. 400—234 7 Claims



1. A ribbon cartridge containing a continuous length of transfer ribbon wound on a supply spool having a circular core member and moveable from said supply spool, through a transfer station external to said cartridge and back onto a take-up spool within said cartridge, said cartridge being suitable for use on a transfer imaging machine containing a means for moving said ribbon from said supply spool, through said transfer station and onto said take-up spool, said cartridge comprising a housing having fixed thereto a generally-circular hub supporting said circular core member of said supply spool for relative rotation thereon, said hub comprising a fixed portion which is fixed to said housing and a moveable portion which is moveable relative to said fixed portion between a relaxed position in which said moveable portion of said hub is biased to press against the inner surface of said core member to lock said core member to said hub, and a retracted position, in which said moveable portion of said hub is moved out of frictional engagement with the inner surface of said core member to permit rotation of said core member on said hub, said moveable portion of said hub comprising a lever arm extending therefrom beyond the outer circumference of the transfer ribbon wound on said core member and having a ribbon-engaging member which extends parallel to the width of the wound ribbon and which is engaged by the rear surface of said ribbon as said ribbon passes from said supply spool to said take-up spool, said lever arm being moveable under the effects of increased tension in the length of ribbon between said supply spool and said take-up spool to move the moveable portion of said hub to said retracted position to release the frictional engagement between the core member and the moveable portion of said hub and permit rotation of said supply spool and dispensing of ribbon therefrom.

4,350,455

HIGH SPEED BASIC AND CONDENSED TAB RACKS

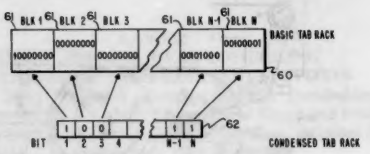
Daniel J. Moore, and Robert A. Pascoe, both of Austin, Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 26, 1979, Ser. No. 107,238
Int. Cl.³ B41J *25/18*
U.S. Cl. 400—279 5 Claims

1. In a printer having horizontal means for moving a carrier through a plurality of escapement positions, means for tabulating said carrier to at least a predetermined one of said escapement positions,

storage means for storing a sequence of bit positions each respectively corresponding to one of said escapement positions, and

means for storing a bit representative of a tab-to position only at each bit position corresponding to a predetermined tab-to position, said means for tabulating comprising



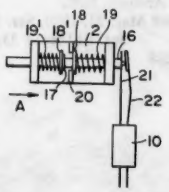
means for accessing only those segments containing a bit representative of a tab-to position.

4,350,456

PRINTER PROVIDED WITH A MARGIN SETTING MECHANISM

Atsushi Noda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1979, Ser. No. 102,788
Claims priority, application Japan, Dec. 21, 1978, 53/160478
Int. Cl.³ B41J *21/02*
U.S. Cl. 400—344 5 Claims



1. A printer comprising:

a carriage provided with a recording head for writing information on a recording medium;

a projecting member mounted on said carriage and moveable thereon against the force of an elastic member;

driving means for causing said carriage to effect scanning movement, and

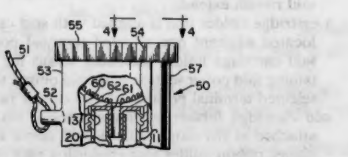
detector means for controlling a writing position of said recording head on said carriage driven by said driving means, said detector means being operable upon contact by said projecting member.

4,350,457

GOLF BALL WASHER AND CLUB CLEANER

G. E. Carnahan, 1007 Regent Ter., Kirkwood, Mo. 63122

Filed Sep. 10, 1980, Ser. No. 185,935
Int. Cl.³ A63B *47/04*
U.S. Cl. 401—11 1 Claim



1. A golf ball and club cleaner comprising:

(a) a flexible container having a threaded neck portion projecting outwardly from the container,

(b) a closure element threadedly received by the threaded neck portion, the closure element including:

1. a cleaning bowl having a cup portion and a passage communicating between the cup portion and flexible container interior, and
2. a dip tube disposed within the flexible container and communicating with the cup portion through the passage for providing a passage between the flexible container interior and the cup portion,

(c) the cup portion of the cleaning bowl including an interior surface having a plurality of inwardly directed cleaning point projections,

(d) the cleaning bowl including a margin having a plurality of projecting teeth,

(e) the cleaning bowl margin including a substantially smooth upper surface,

(f) the teeth projecting radially outwardly from the margin forming substantially triangularly shaped ridges having radially remote cleaning edges, and

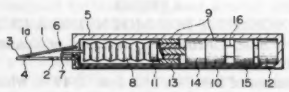
(g) the flexible container including cleaning fluid and being squeezable to supply fluid to the cup portion for application to the golf club for facilitating cleaning of the golf club with the projecting teeth.

4,350,458

FOUNTAIN PEN WITH BATTERY OPERATED SUPPLY DETECTOR AND INK PRESSURIZING DEVICE

Koichi Murahara, Isehara, and Teibun Yasunaga, Hiratsuka, both of Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1980, Ser. No. 129,309
Claims priority, application Japan, Aug. 14, 1979, 54/103403
Int. Cl.³ B43K *5/00, 5/08, 5/18*
U.S. Cl. 401—145 **14 Claims**



1. A hand-held fountain pen comprising:

a pen tip having a slit formed therein;

an ink holding plate provided above said pen tip in such a manner that a capillary ink pool is formed between said pen tip and said ink holding plate, said ink holding plate being made of an electrically non-conductive material;

a detector provided in said ink pool for detecting the quantity of ink therein, said detector comprising said pen tip and an electrode provided on the surface of said ink holding plate on which said ink pool is formed;

a pen holder assembly coupled to said pen tip, said pen holder assembly having an ink storing section which opens into said ink pool, an ink delivery device having a motor section and a pushing member which is coupled to the output shaft of said motor section for depressing said ink storing section, and a battery connected to said delivery device and said detector; and

means for controlling said delivery device in response to an ink quantity detection signal outputted by said detector.

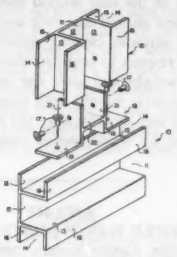
4,350,459

STRUCTURAL MEMBERS

Peter E. Bryant, 10788 La Batista, Fountain Valley, Calif. 94708

Filed Feb. 13, 1981, Ser. No. 234,366
Int. Cl.³ B25G *3/00;* **F16B** *9/00;* **F16L** *41/00*
U.S. Cl. 403—263 **6 Claims**

1. A beam for framework and the like said beam being of the type formed as an elongate rigid member of uniform cross section said beam comprising at least two parallel channels including a first channel defined by a base and spaced apart parallel sidewalls extending from said base normal thereto and a second channel facing outwardly from one sidewall of said first channel, said second channel being defined by a base formed by one sidewall of said first channel and by a pair of spaced apart parallel sidewalls extending from the opposite



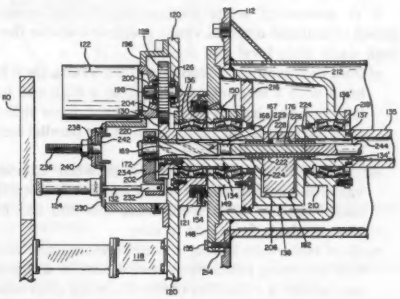
edges of said base and normal thereto so that the thickness of said beam is defined by the height of the sidewalls of said first channel; and the inside width of said first channel is slightly greater than said thickness of said beam.

4,350,460

VIBRATORY COMPACTION SYSTEM

Lynn A. Schmelzer, and W. Thomas Fouser, both of Kewanee, Ill., assignors to Hyster Company, Portland, Oreg.

Filed Mar. 21, 1980, Ser. No. 131,936
Int. Cl.³ E01C *19/38*
U.S. Cl. 404—117 **14 Claims**



4. A vibrator system for a drum employed in earth compaction or the like, said system comprising:

first and second eccentric weights positioned within said drum and adapted to be rotated within said drum to impart vibration thereto,

a first shaft extending coaxially through the hub of said drum, the first of said eccentric weights being mounted for rotation by said first shaft, and means external to said drum for rotating said first shaft,

a second shaft disposed coaxially with respect to said first shaft and having a driving connection with said second eccentric weight for rotating said second eccentric weight, said connection including axially slidable means allowing axial movement of said second shaft with respect to said second eccentric weight while constraining said second shaft and said second eccentric weight for simultaneous rotation,

said first shaft having a driving connection with said second shaft for bringing about concurrent rotation of said shafts and said first and second eccentric weights, said last mentioned driving connection comprising a first internal helical polygonal surface on one of said shafts and a mating externally helical polygonal surface on the other shaft

extending along an appreciable length thereof in engaging relation with said first helical polygonal surface,

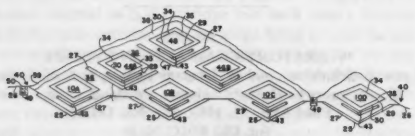
and a linear actuator external to said drum and axially engaging said second shaft for bringing about longitudinal movement of the said second shaft with respect to said first shaft and second eccentric weight, said helical polygonal shaft surfaces causing rotation of the said second shaft with respect to said first shaft to rotate said second eccentric weight and alter the angular position of said second eccentric weight with respect to said first eccentric weight and thereby alter the amplitude of the vibration caused by simultaneous rotation of said eccentric weights.

4,350,461

MULTIPLE WASTE DISPOSAL VAULTS

Richard E. Valiga, Center Square, and John R. Rosso, Mechanicsburg, both of Pa., assignors to Stabatrol Corporation, Norristown, Pa.

Filed Dec. 3, 1980, Ser. No. 212,791
Int. Cl.³ B65G *5/00*; E02D *31/00*
U.S. Cl. 405—128 **8 Claims**



1. A permanent waste disposal installation comprising a group of multiple disposal vaults positioned above the normal high water table level of a region;

at least two parallel, spaced-apart base vaults, each having a basin with a lengthwise slope from a high end toward a low end and having a channel shape from side to side, with the sides of the basins of all of the parallel base vaults being substantially parallel;

an intermediate vault positioned between adjacent base vaults and having a basin with a lengthwise slope from the same high end toward the same low end and having a channel shape from side to side;

each of said vaults having a water-impermeable encapsulation and being positioned above a distinct water-impervious barrier, a collection conduit beneath each said encapsulation and above the said distinct water-impervious barrier, said conduit extending beyond the said lower end of its respective basin; the said collection conduit for the said intermediate vault being aligned between the adjacent sides of the said adjacent base vaults;

said group of multiple disposal vaults being covered with inert covering materials which are graded to correspond to the contour of the region;

means for accumulating leakage and leachate from each said collection conduit.

4,350,462

ROOF SUPPORT PIN

Gerald W. Elders, 38 Yakashba Estates, Prescott, Ariz. 86301

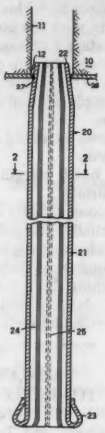
Filed Mar. 28, 1980, Ser. No. 134,939
Int. Cl.³ E21D *21/00*
U.S. Cl. 405—259 **6 Claims**

1. A roof support pin for insertion into a roof bore, the bore having an opening comprising:

(a) an elongate tube for insertion into the bore,

(b) means resiliently compressing the tube prior to insertion of the tube into the bore opening so that the tube expands to frictionally engage the bore in spaced relation to the bore opening for eliminating force exerted on the bore opening, the expansion of the tube anchoring the tube within the bore a distance from the bore opening, and

(c) the said means including a roof support plate having a hole with a diameter smaller than the diameter of the bore,



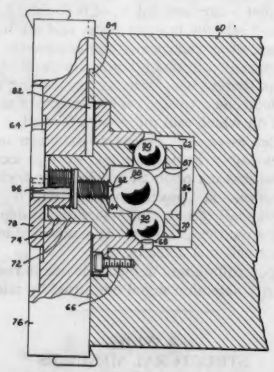
the plate hole compressing the diameter of the tube externally of the bore opening upon insertion of the tube into the bore through the plate hole, the plate hole allowing the tube to expand within the bore a distance from the bore opening.

4,350,463

ARRANGEMENT FOR MOUNTING A CUTTER

Ernest J. Friedline, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 242, Jan. 2, 1979, which is a continuation of Ser. No. 805,916, Jun. 13, 1977, abandoned. This application Mar. 21, 1980, Ser. No. 132,381
Int. Cl.³ B23B *31/00*; B23C *5/26*
U.S. Cl. 409—234 **9 Claims**



1. An arrangement for mounting on a power driven spindle, comprising: a milling cutter, a shank rigidly connecting said cutter and spindle, said cutter, shank and spindle having a common axis of rotation, but said shank and cutter are separate components not threadedly engaged with one another, cooperating elements of abutment means and cooperating elements of keying means between said spindle and said cutter, a bore in said spindle, a shoulder formed on said bore, radially movable clamp elements are mounted in radially outwardly extending

bores foremd on one end of said shank, a central axial perforation is formed in said one end of said shank and communicates with said radially outwardly extending bores having said clamp elements located therein, actuator means located and axially movable within said perforation, and an end cap having a central axial bore communicating with said actuator means on the other end of said shank, said central axial bore being coincident with the direction of axial movement of said actuator means, said clamp elements movable radially outwardly so as to abuttingly engage said shoulder on said bore and urge said cooperating elements of abutment means into engagement by drawing said end cap against said cutter.

4,350,464

ANCHOR BOLT FOR CONCRETE

Richard L. Brothers, 3570 E. M-21, Corunna, Mich. 48817

Filed Sep. 15, 1980, Ser. No. 187,578
Int. Cl.³ E04B *1/38*
U.S. Cl. 411—180 **11 Claims**

1. In an anchor bolt including a metal shaft having a longitudinal axis and having a round cross-sectioned holding portion with a cylindrical surface along and around the axis and a diameter and adapted to be inserted in a hole in concrete the improvement which comprises:

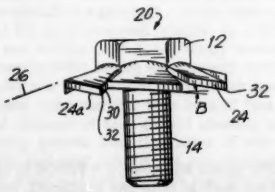
providing at least one weld line around and along the cylindrical surface of the holding portion in a helical pattern along the axis such that the bolt will rotate when forced into a hole of essentially the same diameter in concrete and wherein the holding portion resists being pulled from the concrete along the axis of the shaft.

4,350,465

SPIDER WASHER HEAD SCREW

Louis J. Lovisek, Greenlawn, N.Y., assignor to Industrial Fasteners Corp., Port Washington, N.Y.

Filed Apr. 28, 1980, Ser. No. 144,702
Int. Cl.³ F16B *39/26*
U.S. Cl. 411—186 **8 Claims**



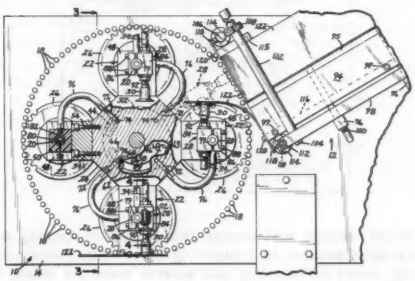
1. A screw having a head; a body defining an axis of rotation, said body extending downwardly from the head and formed integrally therewith; and a flange formed integrally with and extending radially downwardly from said head, said flange being slotted essentially to the base thereof to define a plurality of deformable tabs joined at their respective bases to said head, at least a portion of each tab being twisted relative to its base about an axis extending radially from said axis of rotation along the flange in a direction so that an edge of each of the tabs defined by the slots inclines downwardly, said edge being on the side of the tab facing in the direction of rotation of said screw for removal thereof, the bottom surface of the tabs defining an essentially straight line in radial cross-section except in the region of twist, no portion of said tabs being twisted in an upwardly direction, the thickness of said tabs being selected to permit, when engaged with a workpiece, resilient upward deflection of said tabs to a position extending essentially normally to said body and simultaneous resilient upward deflection of said twisted portions of said tabs to essentially flatten said tabs, so that essentially the entire width and length of the tabs bear on the surface of the workpiece at a fully tightened position.

4,350,466

APPARATUS FOR HANDLING ARTICLES

Melford J. Bahr, Corcoran, and Wayne R. Geist, Rogers, both of Minn., assignors to MGS Machine Corporation, Minneapolis, Minn.

Filed May 8, 1980, Ser. No. 147,956
Int. Cl.³ B65H *3/12*
U.S. Cl. 414—128 **18 Claims**



18. An apparatus for holding articles, comprising:

a support member;

a hub having a periphery and being rotatably supported by said support member;

means for driving said hub;

suction means, spaced about the periphery of and supported by said hub, for attracting and holding said articles;

means for periodically producing a vacuum in said suction means;

driven means for moving said suction means relative to said hub; and

planetary gear means for engaging said driven means as said driving means moves said hub, said planetary gear means including a plurality of pins attached to said support member, said pins being regularly spaced along a circle centered on the rotatable axis of said hub;

whereby said suction means moves articles from first to second locations.

4,350,467

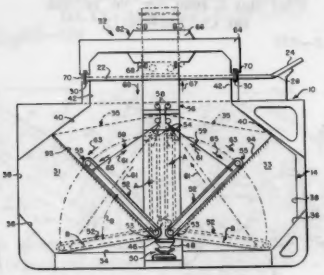
SELF-UNLOADING CARGO VESSEL

Paul Soros, 1102 Oenoke Ridge, New Canaan, Conn. 06840

Filed Jul. 18, 1980, Ser. No. 171,008
Int. Cl.³ B65G *67/58*; B23B *35/30*
U.S. Cl. 414—144 **35 Claims**

1. In a self-unloading apparatus capable of removing bulk material from a plurality of storage chambers therefor in a vessel on which each of said storage chambers has a hatch opening at the top thereof and includes at least one unloading gate extending through the base thereof for regulating the flow of said bulk material through the base of said storage chamber,

and a common longitudinal conveyor means disposed beneath the unloading gates of said chambers and in flow through communication therewith for enabling removal of said bulk material discharged through each of said unloading gates, said bulk material storable in each of said chambers being capable of forming a surface angle with respect to the discharge of said bulk material through said unloading gates; the improvement comprising frame means removably receivable within any of said plurality of storage chambers; and a scraper conveyor means pivotally supported on said frame means and removably disposable along said surface angle for conveying said formed stored bulk material to said one unloading gate for discharge therethrough onto said longitudinal conveyor means, said scraper conveyor means having a proximal end and a distal end and being pivotally supported on said frame means at said proximal end by pivot means mounted adjacent the base of said removable frame means, said frame means further comprising means for retracting and extending said scraper conveyor means distal end between a retracted position for enabling removal and insertion of said supported scraper conveyor



means through said storage chamber hatch opening and an extended position, said retracting and extending means including means for enabling said scraper conveyor means to be substantially continually disposable along said surface angle as said surface angle varies during said emptying of said stored bulk material from said storage chamber through said one unloading gate, means for raising and lowering said frame means into said storage chamber through said hatch opening, with said scraper conveyor means in said retracted position, between a raised position in which said supported scraper conveyor means is removed from said storage chamber and an inserted position in which said lowered frame enables said supported scraper conveyor means to be extended along said surface angle, and means for translating said raised frame means between said plurality of storage chambers for selectively enabling said removal and insertion of said frame supported scraper conveyor means into said inserted position in any of said storage chambers, whereby complete discharge of said stored bulk material from each of said storage chambers may be facilitated.

4,350,468

HIGH-RISE SILOS

Bernhard Jülke, Melle, Fed. Rep. of Germany, assignor to Engelbrecht & Lemmerbrock GmbH & Co., Melle, Fed. Rep. of Germany

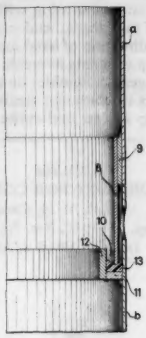
Filed Jan. 5, 1981, Ser. No. 222,283

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1980, 8001051[U]

Int. Cl.³ B65G *65/36*; F16L *25/00*

U.S. Cl. 414—325 **2 Claims**

1. A high-rise silo having a central vertical clearing shaft comprising a plurality of similar pipe sections arranged loosely one above another, to the top of which shaft silage is fed by means of revolving feed members, and is drawn off outwards radially below the silo bottom by means of a conveyor, wherein each pipe section has an inner annular cylindrical flange which is spaced from the lower end of the pipe wall and is hermetically connected to the pipe wall and projects axially beyond the lower rim of the pipe section, and the upper part of



the section having an inner encircling annular groove provided with a sealing ring the bottom of said sealing ring being spaced from the upper rim of the pipe section by an amount which does not exceed the axial length of said annular flange which projects beyond the lower rim of the section.

4,350,469

HANDLING DEVICE MOUNTED ON A VEHICLE TO CARRY OUT THE HANDLING OF LOADS SUCH AS SKIPS AND CONTAINERS

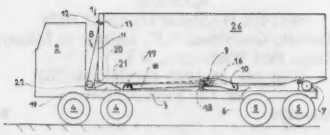
Antoine Corompt, Saint Etienne, France, assignor to Bennes Marrel S.A., France

Filed Jun. 17, 1980, Ser. No. 160,295

Claims priority, application France, Jun. 18, 1979, 79 16332

Int. Cl.³ B60P *1/64*

U.S. Cl. 414—420 **10 Claims**



1. A handling device mounted on a vehicle to carry out the handling of loads such as skips and containers, comprising:

a sub-frame pivoted on a first transverse pivot, which is closely horizontal, provided at the rear of the chassis of the vehicle;

a derrick comprising a main telescopic arm of which the base is pivoted to the free end of the sub-frame by means of a second pivot parallel to the first pivot, and an auxiliary arm provided at its free end with a hook intended to work in conjunction with an anchor point provided at the front of the load;

at least one tilting jack pivoted at the rear to the main arm of

the derrick, and at the front to the chassis of the vehicle to control the swinging movements of the derrick;

a slide jack which controls the extension and contraction of the main telescopic arm of the derrick;

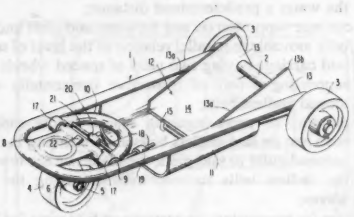
a latching system able to ensure the latching of the main derrick arm in line with the sub-frame, and characterised in that the chassis is provided at the front with a cam intended to work in conjunction with the free end of the main telescopic derrick arm to make the derrick swing slightly upwards at the beginning of the contraction travel of the said main arm from the road position of the device.

4,350,470

WHEEL TRUCK

Hernando Murillo, Calle 82 No. 14-A-17 Piso 4°, Bogotá, Colombia

Filed Jun. 9, 1980, Ser. No. 157,606
Int. Cl.³ B60B *29/00*
U.S. Cl. 414—430 **11 Claims**



1. A wheeled support device for the disabled tire of a vehicle, comprising

(a) a generally U-shaped tubular frame having substantially parallel side members;

(b) a front wheel mounted for pivoting movement centrally between the forward portions of said side members;

(c) at least two rear wheels mounted on an axle extending transversely between the rear portions of said side members;

(d) a substantially U-shaped cradle extending between said side members with its open end facing upwardly and having a width sufficient to receive a tire to be mounted on said support device, each of the arms of the U depending downwardly from a respective one of said side members;

(e) a ramp member mounted upon said axle mounting said rear wheels and pivotable about said axle from a first position in which it presents a rearwardly downwardly inclined surface adapted to receive a tire to be mounted on said support device to a second position in which said surface extends in a generally vertical direction for retaining said tire in its mounted position, to a third position in which said surface faces downwardly toward said cradle;

(f) said ramp member having substantially vertical, generally triangular side walls one of whose sides abuts the ground when said ramp member is in its said first position, the vertical distance of said ground abutting side from said axle being greater than the radius of said rear wheels, whereby said rear wheels are out of contact with the ground when said ramp is in its said first position;

(g) a forward restraining member mounted for movement about a pivot member from a first position in which it extends in a rearward, generally horizontal direction in the plane of said frame to a second position in which it extends in a direction within the range of 45° to 90° from a horizontal plane extending rearwardly from said pivot member above said plane, for retaining said tire in its mounted position; and

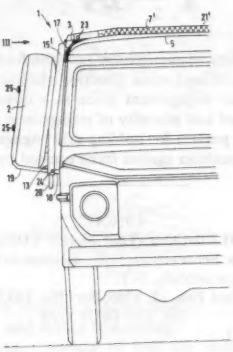
(h) means actuated by movement of said ramp member from its said first position to its said second position for moving said forward restraining member from its said first position to its said second position, said means comprising an abutment member pivotally attached adjacent the leading edge of said surface of said ramp member for forward movement therewith, and a longitudinally extending crank member having one of its ends attached to the pivot axis of said forward restraining member, the other of its ends being abutted by said abutment member as it moves with said ramp member from its said first position to its said second position.

4,350,471

ROOF RACK IN PARTICULAR FOR CROSS COUNTRY VEHICLES, AMBULANCES AND THE LIKE

J. C. Ludwig Lehmann, Lorch, Fed. Rep. of Germany, assignor to Binz GmbH & Co., Lorch, Fed. Rep. of Germany

Filed Oct. 6, 1980, Ser. No. 194,288
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1979, 7929282[U]
Int. Cl.³ B62D *43/02*
U.S. Cl. 414—463 **5 Claims**



1. A roof rack for vehicles, comprising guide members capable of being rigidly mounted on a roof of a vehicle; a load carrying part supported and guided by said guide members; said load carrying part being displaceable on said guide members and pivotable about a substantially horizontal pivot extended transversely of said guide members to move from a substantially horizontal transport position on the roof of the vehicle into substantially vertical loading position at one side of the vehicle; a carriage adapted for limited displacement in said guide members, said pivot lying on one side of said load carrying part relative to the center of gravity of said load carrying part and having a pivot axis extending transversaly of direction of said displacement; and at least one additional guide member rigidly connected to the vehicle and extended around the edge of said vehicle to support said one side of said load carrying part when the latter is displaced between said transport position and said loading position so that the load carrying part is moved from said transport position to said loading position without contacting the vehicle roof.

4,350,472

ELECTRIC FAN APPARATUS

Masao Morimoto, Kasai, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

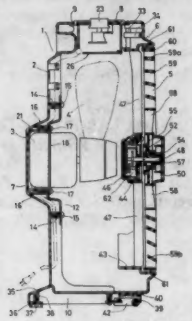
Filed Nov. 13, 1979, Ser. No. 93,596
Claims priority, application Japan, Nov. 14, 1978, 53-157845[U]; Mar. 14, 1979, 54-33343[U]; Mar. 19, 1979, 54-35849[U]; Mar. 23, 1979, 54-38447[U]; Mar. 26, 1979, 54-35826
Int. Cl.³ F04D *29/56*
U.S. Cl. 415—125 **2 Claims**

1. An electric fan apparatus comprising:

a fan;

a wind direction shifting plate disposed in front of said fan and being rotatable by wind generated thereby; and

stop-start means for stopping and starting rotation of said wind direction shifting plate, said stop-start means comprising an engagement piece adapted to engage with one



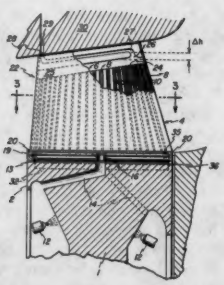
of a plurality of engagement portions formed on an outer periphery of said wind direction shifting plate, a spring urging said engagement piece in a direction to engage with one of said plurality of engagement portions and an operating portion for holding said engagement piece at a shunting position against force exerted by said spring.

4,350,473

LIQUID COOLED COUNTER FLOW TURBINE BUCKET

James T. Dakin, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 22, 1980, Ser. No. 123,519
Int. Cl.³ F01D *5/18*
U.S. Cl. 416—1 **13 Claims**



1. In a liquid cooled turbine bucket adapted for mounting on a rotatable turbine wheel and having a tip region at a radially outward end and an airfoil-shaped portion located radially inward to said tip region, the improvement comprising:

a plurality of radially extending coolant passages disposed in said airfoil-shaped portion;

means for admitting liquid into said passages at radially inwardly disposed sections of said passages;

means for discharging liquid from said bucket disposed in flow communication with radially outwardly disposed sections of said passages, said liquid discharging means including a means for restricting the flow of vapor from said passages into said liquid discharging means; and

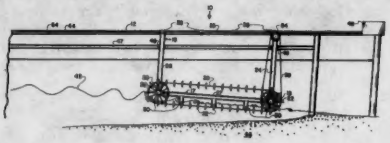
means for discharging vapor from said bucket disposed in flow communication with said passages at second radially inwardly disposed sections of said passages.

4,350,474

TIDE FOLLOWING WAVE POWER MACHINE

James T. Murphy, 6232 Caminito Araya, La Jolla, Calif. 92122

Filed Aug. 1, 1980, Ser. No. 174,365
Int. Cl.³ F03B *9/00*
U.S. Cl. 416—7 **5 Claims**



1. A wave power machine for utilizing the force of breaking waves on a tidal body of water having a beach area comprising:

at least two spaced apart piers extending from the beach into the water a predetermined distance;

a carriage supported on and between said piers and horizontally movable in parallel relation to the level of said water, said carriage having two pairs of spaced wheels rotatably supporting a pair of respective horizontally extending looped endless belts;

a plurality of wave-engaging spaced blades supported at each end on said endless belts and extending between and perpendicular to said piers; the blades on the lower side of the endless belts successionally engaging the breaking waves;

means for supporting the carriage on said piers for longitudinally inclined movement with respect to said water; and

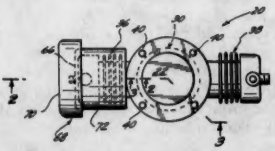
means for controlling the position of the carriage into and away from the beach to follow the incoming and outgoing tides, respectively, to enable the blades to contact the initial breaking waves and utilize their force throughout the entire extent of the wave action.

4,350,475

INTEGRATED OIL-LESS HIGH CAPACITY AIR COMPRESSOR

Meredith W. Meece, Monroe, La., and Win W. Paget, White Lake, N.C., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 20, 1980, Ser. No. 132,019
Int. Cl.³ F04B *37/00*
U.S. Cl. 417—238 **8 Claims**



1. An integrated high capacity oil-less, air cooled compressor, comprising:

a motor having a shaft extending therefrom;

a frame extending about the shaft for mounting the motor;

a bearing bracket spaced from the frame for receiving the shaft for rotation relative thereto;

a fan coupled to the shaft for cooperating in circulating cooling air over parts of the compressor;

a pair of diametrically opposed piston-cylinder assemblies each having a cylinder and piston reciprocal therein coupled with the shaft for providing a compression chamber capable of undergoing a compression stroke incident to the reciprocation of the piston in the cylinder;

a shroud about each piston cylinder assembly for cooperating in directing the circulating cooling air over parts of the compressor;

a plurality of spaced dowel pin assemblies extending from the frame and bracket; and

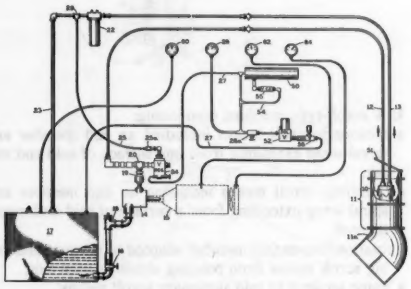
the cylinder of each piston-cylinder assembly having a plurality of lugs, each lug interposed between and coupled with the frame and the bracket by a dowel pin assembly.

4,350,476

HYDRAULIC MOTOR SYSTEM FOR DRIVING A SUBMERSIBLE IMPELLER PUMP IN WHICH HYDRAULIC SURGE AT START-UP AND SHUT-DOWN IS CUSHIONED

J. David Eller, 33 NW. 2 St., Deerfield Beach, Fla. 33441

Filed Jul. 25, 1980, Ser. No. 172,201
Int. Cl.³ F04B *49/02, 9/10*
U.S. Cl. 417—304 **3 Claims**



1. In combination with

a submersible pumping unit with a gate valve and having a rotary pump including an impeller for pumping water, a hydraulic motor in driving relationship with said pump for rotating said pump in one direction to pump the water, and hydraulic lines connected to opposite sides of said motor;

and an above-ground hydraulic system for operating said hydraulic motor in the submersible pumping unit, said hydraulic system including an oil tank, an above-ground pump operatively connected to pump oil from said tank to one of said hydraulic lines of the submersible pumping unit to drive the hydraulic motor for rotating said first-mentioned pump in said one direction, and return conduit means connected between the other of said hydraulic lines for the hydraulic motor in the submersible pumping unit and said oil tank to return the oil from said hydraulic motor to said tank;

the improvement which comprises:

a bypass pressure regulating valve connected in series with means including oil viewing means between the outlet side of said above-ground pump and said return conduit means for said oil tank to limit the pressure of the oil which operates said hydraulic motor in the submersible pumping unit by bypass oil flow, said oil viewing means enabling viewing of bypass oil flow through said regulating valve for adjustment purposes;

a bypass line connected in parallel around said pressure regulating valve;

a hydraulic accumulator in said bypass line for causing hydraulic pressure at the pressure regulating valve to build up gradually at start-up and decrease gradually at shut-down;

a normally open automatic valve in said bypass line which closes at start-up to cause pressure at said pressure regulating valve to build up gradually until said pressure regulating valve diverts fluid to said motor to build up to operating pressure there;

said automatic valve opening at shut-down to drain said accumulator and cause pressure at the motor to decrease;

a flow control valve in said bypass line for limiting the decrease in pressure at shut-down to a selected level at which said motor operates at low speed to stop the closing of said gate valve;

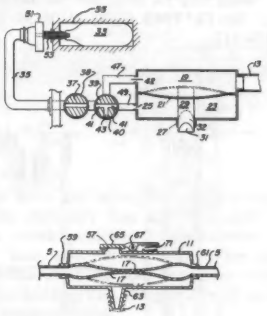
and said automatic valve re-opening after a selected time to permit total shut-down and closing of said gate valve.

4,350,477

PNEUMATIC PULSATILE FLUID PUMP

Charles N. Mazal, Sullivan 119, Mexico 4, D.F., Mexico

Filed Apr. 20, 1977, Ser. No. 789,353
Int. Cl.³ F04B *45/06*
U.S. Cl. 417—384 **3 Claims**



1. A device for creating a cyclic pressure pulse in a closed volume of fluid, said device comprising:

means enclosing a volume of fluid for defining a closed system, said means including a flexible member forming a boundary portion of said enclosing means, said flexible member being biased in a first position extending in a direction outwardly of said enclosing means and movable to a second position extending in a direction inwardly of said enclosing means,

drive means for moving said flexible member from said biased first position to said second position, said driving means including

(i) a housing having a fluid inlet and a fluid outlet,

(ii) valve means operably connected to said flexible member for alternately opening and closing said fluid outlet, said valve means opening said fluid outlet when said flexible member is in said second position, and

(iii) a source of fluid under pressure operably connected to said fluid inlet of the housing to increase the pressure within said housing to move said flexible member inwardly of said enclosing means to said second position whereupon said valve means opens said fluid outlet of the housing to vent the pressurized fluid within said housing and allow said flexible member to return to the biased first position to begin a new cycle in which said source of fluid under pressure again increases the pressure with said housing to move said flexible member inwardly of said enclosing means,

said enclosing means includes a fluid inlet and a fluid outlet, said inlet and outlet each having a valve means for controlling the passage of fluid therethrough, and,

said device further includes a source of fluid under pressure connected to said fluid inlet of the enclosing means whereby each of the valve means for said inlet and outlet can be opened to flush fluid out of said enclosing means and each of said valve means can be selectively operated to raise the pressure of the fluid in said enclosing means by

opening the valve means for the inlet and closing the valve means for the outlet and operated to lower the pressure of the fluid in said enclosing means by closing the valve means for the inlet and opening the valve means for the outlet.

4,350,478

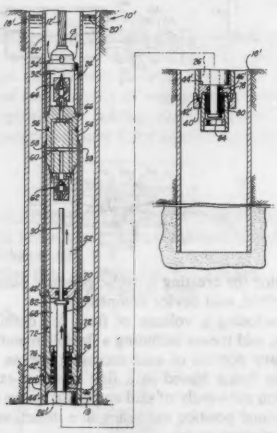
BOTTOM HOLE OIL WELL PUMP

Paul V. Oldershaw, 4812 Hasti Bob Ct.; James E. Hansen, 3708 S. Real Rd., both of Bakersfield, Calif. 93309, and Walter E. Hinds, 1358 Schuyler Rd., Beverly Hills,, Calif. 90210

Filed May 13, 1980, Ser. No. 149,331

Int. Cl.³ F04B *47/06, 21/06, 39/10*

U.S. Cl. 417—417 **26 Claims**



1. A bottom hole pump for use in a well including a casing with tubing of substantially smaller diameter than the casing extending downwardly through the casing to a depth at which liquid is to be pumped from the well, comprising:

an elongate pump housing connected at its upper end with a control cable for lowering and raising the pump housing in the tubing and for connecting the pump with an electrical power source and controls at the surface of the well, the tubing including means for supporting the pump housing at a predetermined pumping depth within the well, the upper end of the housing adjacent its interconnection with the control cable forming an outlet chamber and passage means for connecting the outlet chamber with the interior of the tubing above the pump housing;

inlet means for admitting liquid from the well casing into the pump housing;

a pumping chamber in the pump housing;

a linear motor mounted in the pump housing and being operatively interconnected with the control cable;

a cylindrical plunger reciprocable by the linear motor and extending into the pumping chamber for producing a pumping action therein;

an inlet check valve enabling liquid flow through the inlet means into the pumping chamber; and

an outlet check valve enabling liquid flow from the pumping chamber into the outlet chamber for passage to the tubing above the pump housing.

4,350,479

SCROOL-TYPE FLUID MACHINE WITH LIQUID-FILLED FORCE-BALANCED POCKETS

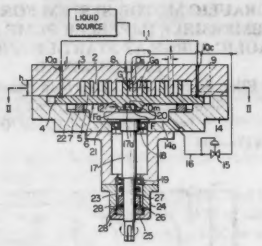
Kenji Tojo; Masato Ikegawa; Masao Shiibayashi, and Masaya Imai, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 9, 1980, Ser. No. 138,730

Claims priority, application Japan, Apr. 11, 1979, 54/43077

Int. Cl.³ F01C *1/02, 21/00*

U.S. Cl. 418—55 **42 Claims**



1. A scroll-type machine comprising:

a stationary scroll means including an end member and a spiral wrap extending from one surface of said end member;

an orbiting scroll means including an end member and a spiral wrap extending from a surface of said end member thereof;

a rotation-preventing member adapted to prevent said orbiting scroll means from rotating about its own axis;

a frame secured to said stationary scroll means;

a crank shaft supported by said frame for rotation about an axis coincident with the axis of said stationary scroll means and having an engagement member located at a position spaced from the axis of the rotation of said crank shaft by a distance equal to a radius of an orbital movement of said orbiting scroll means, said engagement member being adapted to transmit power between said orbiting scroll means and said crank shaft;

a low pressure port;

a high pressure port;

a plurality of circumferentially spaced pockets formed in the end member of one of said stationary and orbiting scroll means and being adapted to confine a liquid therein;

liquid supplying passage means for supplying said liquid to each of said pockets;

intermittent liquid supplying means for controlling a supply of said liquid to each pocket through said liquid supplying passage means such that the supply of said liquid to each pocket is made intermittently at a constant cycle; and

a source of liquid to be supplied to said pockets.

4,350,480

INTERMESHING SCREW ROTOR MACHINE WITH SPECIFIC THREAD PROFILE

Karl Bammert, Alleestrasse 3, 3000 Hanover, Fed. Rep. of Germany

Filed Dec. 7, 1979, Ser. No. 101,079

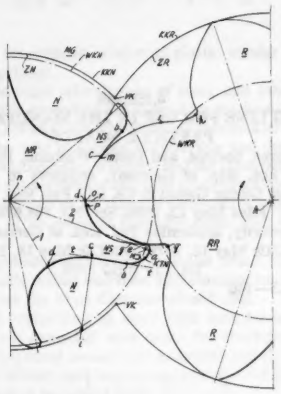
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911415

Int. Cl.³ F01C *1/16;* **F04C** *18/16;* **F16H** *55/08*

U.S. Cl. 418—201 **21 Claims**

1. In a screw rotor machine including a housing defining a pair of intersecting parallel bores, and a pair of rotors mounted for rotation within said bores of said housing, said rotors having intermeshing helical threads and grooves, with the threads and grooves of one of said rotors lying substantially outside the pitch circle of said one rotor and with the threads and grooves of the other of said rotors lying substantially inside the pitch

circle of said other rotor, said threads of said other rotor including a crest portion located substantially outside the pitch circle of said other rotor, with flanks of the threads of said other rotor defining, respectively, one side each of adjacent grooves located on opposite sides of said thread, one of said flanks of said threads of said other rotor operating to define the side of an adjacent groove which is the trailing side of said groove when said machine is operated as a compressor and the leading side when said machine is operated as a motor, said trailing side of said groove being substantially generated from a point in said groove closest to the axis of said other rotor to a point where said groove intersects the pitch circle of said other rotor by a crest portion of the respective thread of said one rotor which is radially most remote from the axis of said



one rotor, the improvement which comprises that said radially remote crest portion of said one rotor is rounded with a relatively small radius dimension to generate the flanks of the threads of said other rotor to be tangent to a plurality of circles having centers which lie on a radial line which is curved in the direction of rotation of said other rotor, said circles having diameters which decrease taken from the radially innermost to the radially outermost of said circles, with said crest portion of said threads of said other rotor being shaped in conformity with the radially outermost of said plurality of circles, said radially outermost circle having a center which is located within and closely adjacent to the pitch circle of said other rotor, said crest portion thereby projecting beyond said pitch circle of said other rotor a distance corresponding approximately to the radius of said outermost circle.

4,350,481

APPARATUS FOR CENTRIFUGAL CASTING OF THERMOSETTING PLASTICS

John E. Corea, 414 12th St., Lakewood, N.J. 08701; Emanuel R. Corea, 102 10th Ave., Belmar, N.J. 07719, and Irving Tashlick, 675 Ocean Ave., Long Branch, N.J. 07740

Filed Mar. 11, 1981, Ser. No. 242,594
Int. Cl.³ B29C 5/04
U.S. Cl. 425—73 **9 Claims**

1. An apparatus for centrifugal casting of thermosetting plastics and the like, said apparatus including:

(a) a stationary base;

(b) a spinner rotatably journaled in and through said stationary base;

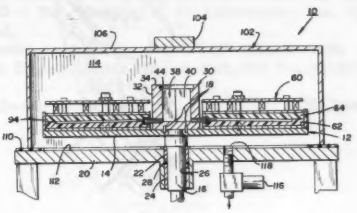
(c) means for rotating said spinner;

(d) a dividing hub adapted for removable mounting on said spinner and adapted to spin with the rotation of said spinner, said dividing hub having a top, a bottom, a plurality of sides, a reservoir within said diving hub with said hub having a plurality of nozzles, each of said nozzles extending radially from the sides of said dividing hub;

(e) each of said nozzles having a conduit connecting an extreme tip of each nozzle with a bottom portion of the reservoir within the dividing hub and providing for passage therethrough of a pre-measured quantity of the thermosetting plastic from the reservoir to the extreme tip of each nozzle during the casting process;

(f) a plurality of casting molds each adapted to removably engage a nozzle, the casting molds adapted to receive and mold the thermosetting plastic or the like after delivery from said tip of the nozzle;

(g) a clamping means for retaining the casting molds to the dividing hub during the rotation of the spinner;



(h) a vacuum hood and means for pivotally securing said hood to the stationary base and with gasket means to provide a vacuum chamber in combination with said stationary base, said vacuum hood when swung into closed condition on the stationary base enclosing the spinner, the dividing hub, the plurality of casting molds and said clamping means;

(i) a vacuum means connected to the vacuum chamber and with valve means and with the chamber closed adapted to evacuate said vacuum chamber to a predetermined pressure, and

(j) a drive means for rotating the spinner, the mounted dividing head, the plurality of casting molds after engagement with the nozzles extending from the dividing hub and the clamping means for retaining the plurality of molds to the dividing hub.

4,350,482

APPARATUS FOR PRODUCTION OF FIBROUS SHEET MATERIAL

Vyacheslav S. Alexandrov, ulitsa S. Kovalevskoi, 7, korpus 5, kv. 66; Alexandr E. Guschin, Kovensky pereulok, 13, kv. 18; Rudolf V. Zavodov, ulitsa D. Bednogo, 22/2, kv. 113; Elena I. Zhukova, prospekt M. Torezа, 92, kv. 25; Alexandr A. Ivanov, Krasnoselsky raion, Fabrichny poselok, 5; Tatyana S. Fofanova, Serebristy bulvar, 18, korpus 2, kv. 237; Evgeny I. Mikhailov, prospekt Slavy, 16, kv. 270; Ivan M. Dianov, ulitsa Zverinskaya, 17-a, kv. 9; Pavel M. Luzin, Institutsky proezd, 9, kv. 68; Igor A. Sergeev, prospekt Stachek, 27, kv. 8; Lidia A. Pankratova, ulitsa Ryleeva, 17, kv. 17; Vera E. Krylova, prospekt Slavy, 2, korpus 2, kv. 41, and Semen A. Leibenzon, Srednaya Podyacheskaya ulitsa, 15, kv. 1, all of Leningrad, U.S.S.R.

Division of Ser. No. 957,478, Nov. 3, 1978, Pat. No. 4,263,241.
This application Sep. 22, 1980, Ser. No. 189,097
Int. Cl.³ B29J 1/02
U.S. Cl. 425—83.1 **10 Claims**

1. An apparatus for producing fibrous sheet material, comprising:

(a) means for dispersing fibers in a gas stream to form a gas-fiber stream;

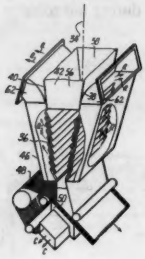
(b) a slot nozzle communicating with said fiber dispersing means, having an inlet opening to receive the gas-fiber stream, and an outlet opening,

said slot nozzle having parallel side walls normal to converging frontal walls;

(c) a chamber having an inlet opening communicating with the outlet opening of said slot nozzle, and an outlet opening;

(d) guide means for removing a portion of the gas from the gas-fiber stream, arranged in parallel rows in said chamber below the outlet opening of said slot nozzle;

(e) branch pipes to remove a portion of the gas from said chamber, said branch pipes arranged in the upper portion of said chamber;



(f) a flat screen to form a fibrous layer thereon, disposed underneath said chamber substantially in a zone where the gas-fiber stream flows from the outlet opening of said chamber;

(g) a suction box to remove the remaining portion of the gas from the gas-fiber stream flowing onto said flat screen, said suction box arranged below said flat screen; and

(h) means for converting the fibrous layer formed on said flat screen to obtain a finished sheet material.

4,350,483

APPARATUS FOR THE CONTINUOUS PRODUCTION OF BUILDING ELEMENTS HAVING CELLULAR CORES

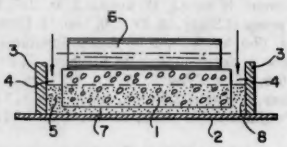
Alain Bonnet, Clermont, France, assignor to Saint Gobain Industries, Neuilly, France

Division of Ser. No. 128,087, Mar. 7, 1980, Pat. No. 4,312,822, which is a continuation of Ser. No. 12,716, Feb. 16, 1979, abandoned, which is a continuation of Ser. No. 575,387, May 9, 1975, abandoned, which is a continuation of Ser. No. 278,819, Aug. 8, 1972, abandoned. This application Jan. 19, 1981, Ser. No. 226,499

Claims priority, application France, Aug. 10, 1971, 71 29174

Int. Cl.³ B28B *5/02*; B29D *3/00*

U.S. Cl. 425—115 **14 Claims**



1. Apparatus for the manufacture of structural materials and the like which comprises

a moving channel having a bottom conveyor and side belts,

means to move it continuously,

means to put a ribbon of cellular material into said channel,

means to load said channel with fluid hardenable material by pouring it into a space between the side edges of said ribbon and said side belts to move said ribbon upwardly by the buoyant force of said fluid hardenable material,

means to stop the upward movement of the ribbon to form a bottom facing of desired thickness,

means downstream of said stop means for pouring a top facing onto the top of said ribbon and onto the lateral portions of the bottom facing;

said fluid material being in contact with the ribbon,

means to maintain the ribbon in the fluid in the channel until the fluid sets thereon, and

means to remove the ribbon and its coating of set fluid from the moving channel.

4,350,484

FORMING LINE FOR USE IN THE MANUFACTURE OF PARTICLE BOARDS

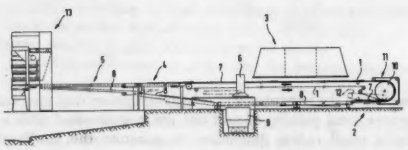
Günter Seeger, Springe, and Dieter Wiemann, Barsinghausen, both of Fed. Rep. of Germany, assignors to Bison-Werke Bähre und Greten GmbH & Co. KG, Fed. Rep. of Germany

Filed May 12, 1980, Ser. No. 148,688

Claims priority, application Fed. Rep. of Germany, May 18, 1979, 2920219; May 18, 1979, 2920220; May 18, 1979, 2920221

Int. Cl.³ B29J *5/08*

U.S. Cl. 425—140 **30 Claims**

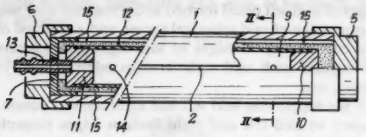


1. Apparatus for the manufacture of particleboard sections from cellulose based particulate material, the apparatus comprising a forming conveyor having upper and lower runs and arranged, in operation, to run continuously around first and second deflection drums with said upper run moving from said first deflection drum to said second deflection drum, a mat carrier forwarding station located at said first deflection drum and cooperating with said lower run to feed individual mat carriers with predetermined overlap onto said forming conveyor, a scattering station for scattering said particulate material in the form of a continuous mat onto the mat carriers, separating means for dividing the mat onto individual mat sections located on individual mat carriers, a transport conveyor section following said forming conveyor for picking up loaded mat carriers from the forming conveyor and for accelerating each mat carrier thereby to separate it from the next following mat carrier, a storage conveyor following said transport conveyor section, a multi-storey press for pressing said mat sections on said mat carriers, a vertically movable stacker loader having a number of tiers arranged between said storage conveyor and said multi-storey press, transport means for transferring loaded mat carriers from said storage conveyor into the tiers of said stacker loader, said stacker loader being adapted to transfer loaded mat carriers located in its tiers into one side of said multi-storey press and to withdraw mat carriers from the same side of said multi-storey press, and return conveyor means located beneath said storage conveyor and driven in the opposite direction thereto for returning unloaded mat carriers from said stacker loader to said mat carrier forwarding station.

4,350,485
DEVICE FOR MOULDING CYLINDRICAL PIECES

Andre Larribe, Le Pecq, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Continuation of Ser. No. 147,499, May 7, 1980, abandoned. This application Aug. 31, 1981, Ser. No. 297,755
Claims priority, application France, May 25, 1979, 79 13314
Int. Cl.³ B29C *17/00*
U.S. Cl. 425—389 **3 Claims**



1. A mold for forming reinforced plastic tubular pieces and the like comprising:

an outer cylindrical tube formed of steel, said tube having a longitudinally extending slit formed by mechanically working the wall of an unslit tube to create therein a stress tending to cause the tube to expand transversely and then splitting the tube longitudinally, whereby said slit is formed spontaneously, said slit permitting said tube to contract diametrically on the application of an external force and to expand under the action of its inherent elasticity when said force is removed;

an inner expansible cylindrical mandrel fitted substantially concentrically within said tube, said mandrel having a diameter less than the inner diameter of said tube;

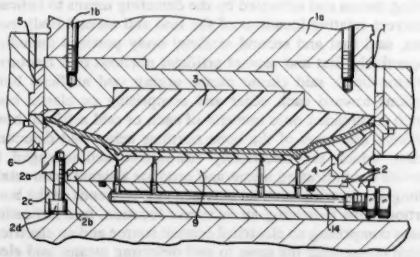
said mandrel comprising an inner rigid tube having a perforated section provided with holes for fluid flow and an inflatable bag fitted around said inner tube and enclosing said perforated section, said bag having a mouth which is hermetically sealed to said inner tube;

means for supplying fluid under pressure to said inner tube, whereby said bag can be caused to expand radially, and clamping means for applying a deforming radial force to said outer tube.

4,350,486
PRESS FOR CERAMIC MOLDINGS

Hans-Henning Croseck, Konz, and Rolf Jung, Trier, both of Fed. Rep. of Germany, assignors to Laeis-Werke AG, Trier, Fed. Rep. of Germany

Filed Dec. 1, 1980, Ser. No. 211,746
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1979, 2948643
Int. Cl.³ B28B *7/06, 7/34;* B29C *1/00*
U.S. Cl. 425—412 **6 Claims**

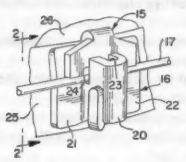


1. A press mold for pressing and molding articles of ceramic material having undulated or serrated edges, said press mold having upper and lower jaws confronting each other and movably mounted relative to each other, an upper and lower die respectively mounted on said upper and lower jaws, upper and lower parts made of synthetic material or rubber and having confronting matrices which respectively adhere to said upper and lower dies, a press ring coaxially mounted around at least one of said dies, but one matrix of said confronting matrices having an inner undulated or serrated contoured edge which corresponds to the outer undulated or serrated edge of the molding made by the press mold, and both matrices also each having an outer edge which has an even periphery, e.g. a circle, which periphery in the radial direction of the surface of the molding is at least coextensive with the largest diameter of the molding.

4,350,487
LOCK PIN

Peter C. Kesling, LaPorte, and Dennis B. Henderlong, Michigan City, both of Ind., assignors to TP Laboratories, Inc., LaPorte, Ind.

Continuation-in-part of Ser. No. 139,869, Apr. 14, 1980, abandoned. This application Mar. 16, 1981, Ser. No. 243,832
Int. Cl.³ A61C *3/00*
U.S. Cl. 433—14 **25 Claims**

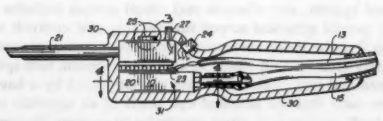


1. In combination with a bracket having a body with an occlusogingivally extending opening, attaching flanges at the lingual side of the body, and a mesiodistally extending archwire slot at the gingivolingual corner of said body, a lock pin for locking one or more archwires against the bottom of said slot comprising a tail extending into said opening, means coplanar with the tail and coacting with the bracket to prevent relative rotational movement between the bracket and the pin along a buccolingual axis, and a head on the end of the pin received in said slot in overlying relationship to said archwire or archwires and in overlapping abutting relationship to said means and having a mesiodistal width at least equal to about one-half the mesiodistal width of the bracket to extend beyond at least one side of the body and a buccolingual depth substantially equal to that of said slot thereby defining an elongated mesiodistally extending rectilinear archwire engaging face for engaging a substantial length of the archwire to control mesiodistal inclination between the bracket and archwire.

4,350,488
DENTAL PULP TESTER

Laurance B. Davis, 3417 E. Turquoise, Phoenix, Ariz. 85028

Filed Jun. 29, 1981, Ser. No. 278,834
Int. Cl.³ A61C *3/00*
U.S. Cl. 433—32 **3 Claims**



1. Apparatus for applying heat and cold to a tooth to determine if the nerves in the pulp of the tooth are alive, comprising,

(a) a housing;

(b) a thermoelectric module carried in said housing includ-

ing a plurality of semiconductor elements connected at their ends by a pair of opposed groups of electrically conductive plates to form an electrical series of said semiconductor elements, each of said pair of plate groups constituting hot junctions when electrical current passes through said series in one direction and constituting cold junctions when electrical current passes through said series in the reverse direction,

(c) a primary heat transfer member in thermally conductive contact with one of said pair of plate groups,

(d) a secondary heat transfer member in thermally conductive contact with the other of said pair of groups of plates, said secondary heat transfer member including

(i) a thermally conductive casing, and

(ii) passage means formed within said casing to receive and carry fluid therethrough and including at least one inlet and one outlet opening, said fluid absorbing and transporting heat away from said casing,

(e) an intake conduit for directing fluid into said inlet opening of said passage means,

(f) a discharge conduit for receiving fluid flowing through said outlet opening,

(g) a pump for imparting motive power to and directing said fluid through said conduits and said passage means,

(h) terminals for making electrical contact with said thermoelectric module,

(i) a source of current electrically connected to said terminals,

(j) normally closed switch means connected between said terminals and said current source,

(k) an elongate probe member of heat conductive material in thermally conductive contact with said primary heat transfer member; and,

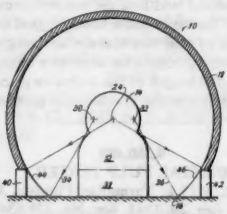
(l) a thermocouple unit in thermal contact with said primary heat transfer member for measuring the temperature of said primary heat transfer member and for causing said switch means to open when the temperature of said primary heat transfer member reaches a preselected level.

4,350,489

DOME FIELD OF VIEW SCENE EXTENDERS

David P. Gdovin, Vestal, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Dec. 5, 1980, Ser. No. 213,521
Int. Cl.³ G09B 9/08
U.S. Cl. 434—40 **5 Claims**



1. In a vehicle simulator including a controls section and visual system, and wherein said visual system includes a hollow, partial spherical screen surrounding said controls section such that the inside surface of said hollow screen provides the display area for said visual system, and wherein said spherical screen and said controls section are supported by a base platform such that the nominal eye point of an operator of said controls section is in close proximity to or near the center of said spherical screen, and such that said partial spherical screen includes left and right bottom edges with respect to said cockpit, an improvement for increasing the display area of said screen comprising:

first spacing means for increasing the distance between said nominal eye point of said controls section and said base platform a selected distance;

second spacing means for increasing the distance between the spherical center of said screen and said base platform said selected distance;

left and right curved screen panels with a multiplicity of edges defining a selected shape and having a curved surface, said curved surface defining a portion of the inside surface of a hollow sphere having the same diameter as said spherical screen, a selected one of said multiplicity of edges of said left panel formed to correspond with said left bottom edge of said spherical screen and a selected one of said multiplicity of edges of said right panel formed to correspond with said right bottom edge of said visible screen; and

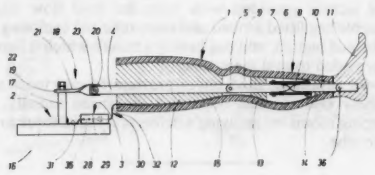
means for supporting said left and right curved panels with respect to said left and right bottom edges respectively such that the display area of said spherical screen is increased so that an operator of said vehicle simulator will view said screen panels and any visual scene presented thereon when said operator's eye point is moved from said nominal eye point to extreme left and right limits.

4,350,490

DEVICE FOR USE WHEN TRAINING THE APPROPRIATE HANDLING OF A DISLOCATED INJURY ON A PART OF A BODY

Jan D. Sandegard, 830 43 As, Sweden

Filed Oct. 2, 1980, Ser. No. 193,259
Claims priority, application Sweden, Oct. 4, 1979, 7908218
Int. Cl.³ G09B 23/32
U.S. Cl. 434—274 **2 Claims**



1. A device for use in training personnel for handling a fracture injury in bones of a body comprising a simulation of a part of the body provided with a simulated fracture separating a first body portion relative to a second body portion of said part, said first and second body portions being connected to each other by means of elastic connecting means to relocate the same in a normal position with respect to each other, detecting means for detecting relative location of the first and second body portions, indicating means connected to the detecting means and activated by the detecting means to indicate incorrect relative locations of the first and second body portions, said first and second artificial body portions including respectively first and second artificial portions of a fractured skeleton bone, said elastic means urging said artificial bone portions toward each other and comprising an elastic hose which is threaded onto one end of each of said artificial bone portions, said ends of the bone portions being said detecting means, which are electrically conductive and arranged to activate the indicating means and produce a signal upon establishing an electrical contact between said two ends of the bone portions thus indicating an incorrect location, said indicating means comprising an electrical current source and an electrical circuit connecting the same to said detecting means, said electrical circuit being adapted to be closed upon electrical and mechanical contact between said two ends of the artificial bone members resulting in activation of the indicating means, thereby designating an incorrect location, and to be interrupted when said ends of the bone portions are not in contact thereby resulting in an inactive condition of the indicating

means showing that an improper positioning the artificial bone members has not occurred.

4,350,491

CONE-PULLEY BELT-TYPE TRANSMISSION

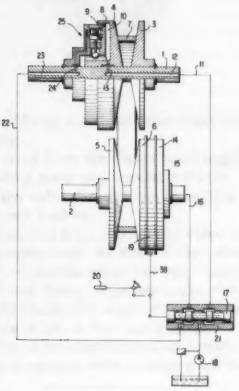
Herbert Steuer, Bad Homburg, Fed. Rep. of Germany, assignor to P.I.V. Antrieb Werner Reimers GmbH & Co. KG, Bad Homburg, Fed. Rep. of Germany

Filed Feb. 27, 1980, Ser. No. 125,250

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1979, 2910546

Int. Cl.³ F16H 55/56

U.S. Cl. 474—12 **4 Claims**



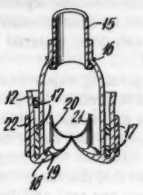
1. In an infinitely variable cone pulley transmission having driving and driven shafts, at least two cone pulley pairs each on a respective shaft, with one pulley of each pair being axially movable and rotatable relative to its associated shaft and having an axially projecting portion defining a rotating hydraulic cylinder, two pistons each mounted on a respective shaft to rotate as a unit therewith and inserted within the hydraulic cylinder of the one pulley on its associated shaft to define a hydraulic fluid chamber, a transmission element connected to circulate between the pulley pairs for transmitting power between the shafts, hydraulic fluid supply means including a source of hydraulic pressure fluid, fluid delivery passages communicating with the two hydraulic fluid chambers, a hydraulic fluid return passage communicating with a low pressure hydraulic fluid receiving region, a control slide valve connected between the source of hydraulic pressure fluid and the fluid delivery passages for controlling the hydraulic pressure in each chamber which determines the force with which the associated pulley pair bears against the transmission element, a transmission ratio setting member coupled to the slide valve for setting the transmission ratio between the shafts, a pressure control valve communicating with the fluid return passage and mounted on one of the shafts to rotate therewith and being adjustable in dependence on the torque between the shaft on which it is mounted and the one pulley of the pair on that shaft, and means including an axially extending bore in the one of the shafts for supplying the pressure control valve with hydraulic fluid at the pressure in the hydraulic fluid chamber of the cylinder associated with the driven shaft for causing the pressure control valve to control the pressure in that chamber in dependence on the set transmission ratio and the mechanical load on the transmission, the pressure control valve being composed of a member defining a pressure control cylinder communicating with the axially extending bore in the one of the shafts and with the fluid return passage, a valve body movable in the pressure control cylinder for varying the flow path defined by the flow control valve between the chamber of the cylinder associated with the driven shaft and the low pressure hydraulic fluid receiving region, a movably mounted intermediate member for moving the valve body, and means defining a V-shaped groove in the axially projecting portion defining the rotating hydraulic cylinder associated with the shaft on which the pressure control valve is mounted, the V-shaped groove extending parallel to the axis of that shaft and contacting the intermediate member for moving the valve body in response to rotation of the shaft on which the pressure control valve is mounted relative to the axially projecting portion defining the cylinder associated with that shaft, the improvement wherein said member defining said pressure control cylinder is mounted in said piston which is mounted on the same shaft as said pressure control valve and said V-shaped groove is disposed in an axially extending surface of its associated axially projecting portion.

4,350,492

METHOD FOR PREPARING TISSUE HEART VALVE

John T. M. Wright, Huntington, and George M. Acosta, Long Beach, both of Calif., assignors to Vascor, Inc., Anaheim, Calif.

Filed Aug. 24, 1981, Ser. No. 295,427
Int. Cl.³ D01C 3/00; A61F 1/22
U.S. Cl. 8—94.11 29 Claims



1. A method of fixing a natural tissue heart valve for implantation comprising

excising the valve from the donor heart together with adjacent ascending aorta and vestibule tissue;

pressurizing the valve through the ascending aorta to coapt the valve cusp leaflets;

placing a cylindrical form around the valve with the base of the form aligned with the base of the valve cusps;

extending the vestibule tissue outward beyond the base of the cylindrical form, simultaneously pulling the septal shelf toward the outside edge of the valve while maintaining coaption of the valve cusp leaflets;

fixing the valve in its extended state and while the leaflets are coapted by treatment with a tanning solution.

4,350,493

CARRIER COMPOSITION FOR DISPERSE DYES

Hans-Peter Baumann, Ettingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Mar. 27, 1981, Ser. No. 248,625
Claims priority, application Switzerland, Mar. 27, 1980, 2422/80
Int. Cl.³ C09B 67/00
U.S. Cl. 8—617 19 Claims

1. A composition comprising

(a) 70–87.5% by weight of an aromatic hydrocarbon mixture containing more than 30% by weight of a mixture of alkylbenzenes having two or more methyl groups or at least one ethyl, propyl or butyl group on the benzene nucleus, which aromatic hydrocarbon mixture has a boiling point range of from 160° to 280° C.;

(b) 10 to 20% by weight of the condensation product of castor oil with 30 to 50 mols ethylene oxide;

(c) 0.5 to 5% by weight of the condensation product of a fatty acid with 5 to 8 mols ethylene oxide and

(d) 2 to 5% by weight paraffin oil,

said composition being free from any anionic dispersing agent.

4,350,494

PROCESS FOR THE DYEING OF TEXTILE MATERIAL AND APPARATUS FOR CARRYING OUT THE PROCESS

Hans Scheidegger, Binningen, Switzerland; Hermann Flensberg, Weil am Rhein, Fed. Rep. of Germany, and Roland Bauhofer, Böckten, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 935,830, Aug. 22, 1978, abandoned, which is a continuation of Ser. No. 755,699, Dec. 30, 1976, abandoned. This application Jan. 30, 1981, Ser. No. 230,150
Claims priority, application Switzerland, Jan. 6, 1976, 51/76
Int. Cl.³ D06P 1/39, 3/06
U.S. Cl. 8—636 10 Claims

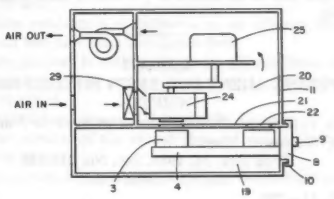
1. In a process for the level dyeing of synthetic polyamide textile material by exhaustion in an aqueous dyebath using an anionic, metal-free, non-fiber-reactive dyestuff, the improvement which comprises (1) contacting the textile material with the dyebath at a pH value in the range of 6 to 12, (2) during the dyeing, exhausting the dyestuff onto the textile material by lowering the pH by at least one pH unit by the addition of an inorganic acid having a pKa value of less than 3.8 at 20° C., (3) separating the dyed textile material from the exhausted dyebath (4) adding to the exhausted dyebath additional dyestuff and sufficient alkali to adjust the dyebath pH value to the range of 6 to 12, and (5) repeating steps (1) and (2).

4,350,495

CHEMILUMINESCENCE APPARATUS AND METHOD FOR DETERMINING THE OXIDATIVE STABILITY OF POLYMERS

Lawrence J. Broutman, 1037 Edgebrook La., Glencoe, Ill. 60022; Boris Rozhansky, 4902-B W. Carol, Skokie, Ill. 60077, and Lev Zlatkevich, 1310 Lunt, Apt. 105, Chicago, Ill. 60626

Filed Dec. 8, 1980, Ser. No. 214,231
Int. Cl.³ G01N 21/76, 33/44
U.S. Cl. 23—230 PC 19 Claims



1. A method of determining chemical processes accompanied by chemiluminescence and oxidative stability of a polymer by measuring the chemiluminescence produced by autooxidation of the polymer comprising heating the polymer in a cell to elevated temperature, exposing the polymer to oxygen for thermal oxidation of the polymer, recording the light intensity versus time given off by the polymer during oxidation while at relatively constant temperature from which the chemiluminescence can be determined by auto oxidation of the polymer.

4,350,496

MEASURING THE AROMATIC REACTIVITY OF A HYDROCARBON COMPOSITION

Carlon C. Chambers, 526 20 1/4 Rd., Grand Junction, Colo. 81503

Continuation-in-part of Ser. No. 54,690, Jul. 5, 1979, abandoned. This application Jan. 23, 1981, Ser. No. 273,850
Int. Cl.³ G01N 31/06, 33/26
U.S. Cl. 23—230 M 40 Claims

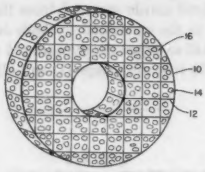
1. A method for determining the relative aromatic activity of hydrocarbon compositions comprising measuring and comparing the ability of the compositions to be sorbed by a polymeric rubber matrix.

15. A method for determining the aromatic activity of a hydrocarbon composition comprising determining the aromatic equivalent (AE) value of the composition by measuring the ability of the composition, when in physical contact with a polymeric rubber matrix under standardized conditions, to cause a short term weight gain and/or swelling of the rubber matrix and comparing this value to a predetermined aromatic activity of a standard mixture to obtain the volume percent AE value.

4,350,497
REINFORCED GRINDING DEVICE

Abraham Ogman, Nine Downing Rd., Peabody, Mass. 01960

Filed Sep. 8, 1980, Ser. No. 185,347
Int. Cl.³ B24D 3/00
U.S. Cl. 51—296 6 Claims



1. A reinforced grinding device comprising:
a honeycomb structure having walls defining open cells, said honeycomb structure being configured to define the shape of the grinding device; and
a blend of abrasive grains secured within a bond matrix deposited in said cells, said cells of the honeycomb structure being filled completely with said blend of abrasive grains and bond matrix to produce a solid unitary structure.

4,350,498
DAMPENING AGENT FOR RESIN BONDED GRINDING WHEELS

William F. Zimmer, Paxton, Mass., assignor to Norton Company, Worcester, Mass.

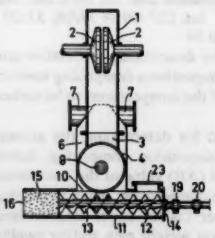
Filed Dec. 24, 1980, Ser. No. 219,710
Int. Cl.³ C08K 5/05
U.S. Cl. 51—298 5 Claims

1. A process of making a grinding wheel from a mixture including abrasive grains, fillers and an uncured powdered resin bond, comprising blending said mixture, dampening the mixture during the blending step with a dampening agent selected from the group consisting of monohydroxy aliphatic alcohol with a carbon chain length of 6 to 18 carbon atoms and phenol substituted with an alkyl chain of 6 to 18 carbon atoms; said agent being essentially a non-solvent for the resin at room temperature but which may become a solvent therefor at temperatures above about 45° C.; pressing the blended mixture into a wheel form; and curing the resin with heat above 45° C.

4,350,499
VAPOR SEPARATING METHOD AND APPARATUS

Rolf B. Lundgren, Sundsvall, Sweden, assignor to Sunds Defibrator Aktiebolag, Sundsvall, Sweden

Filed Feb. 20, 1981, Ser. No. 236,494
Claims priority, application Sweden, Feb. 27, 1980, 8001538
Int. Cl.³ B01D 45/14; B02C 23/02
U.S. Cl. 55—1 10 Claims



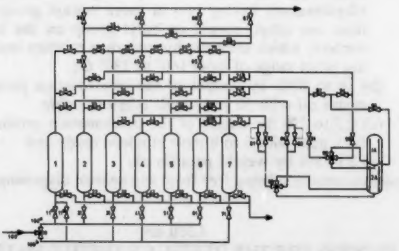
1. A method of separating vapor from cellulosic material which has been refined at a predetermined elevated pressure comprising discharging said refined cellulosic material containing said vapor downwardly through an inlet opening into a discharge chamber maintained substantially at said predetermined elevated pressure, deflecting said vapor laterally with respect to said cellulosic material passing downwardly through said inlet opening, passing said vapor through said discharge chamber at a flow rate of less than about 15 meters/sec. whereby cellulosic material carried by said vapor is separated from said vapor by sedimentation, separating said vapor from said discharge chamber in a substantially vertical direction, and discharging said cellulosic material from said discharge chamber.

8. Apparatus for separating vapor from cellulosic material which has been refined in a refiner at a predetermined elevated pressure comprising a discharge chamber including an inlet adapted to be connected to the outlet of said refiner and an outlet, said discharge chamber including a portion disposed laterally with respect to said discharge chamber inlet opening, conveyor means for moving said cellulosic material laterally with respect to said discharge chamber inlet opening in a first direction towards said discharge chamber outlet so as to create a substantially gas-tight plug of cellulosic material at said outlet in order to maintain said discharge chamber substantially at said predetermined elevated pressure, said conveyor means including vapor passage means for causing said vapor to pass laterally with respect to said discharge chamber inlet opening in a second direction and in a direction different from the direction in which said conveyor means moves said cellulosic material, and vapor collection and discharge means located at said portion of said discharge chamber disposed laterally with respect to said discharge chamber inlet opening and displaced from said discharge chamber inlet opening in said second direction for collecting and discharging said vapor therefrom in a substantially vertical direction with respect to said discharge chamber.

4,350,500
PROCESS AND APPARATUS FOR SEPARATING GASEOUS COMPONENT FROM A MIXTURE

Abraham J. Esselink, Voorschoten, Netherlands, assignor to Ingeniersbureau "Essex" B.V., Voorschoten, Netherlands

Filed Jul. 15, 1980, Ser. No. 169,053
Claims priority, application Netherlands, Jul. 17, 1979, 7905561
Int. Cl.³ B01D 53/04
U.S. Cl. 55—26 7 Claims



1. A process for the purification of a hydrogen containing gas mixture by selective, adiabatic adsorption of impurities therein on an adsorbent, followed by desorption of the impurities and regeneration of the adsorbent by pressure relief and purging of the adsorbent at low pressure with less contaminated to practically pure gas and repressurization, while applying a number of zones containing adsorbent, said zones being used alternatively in a cyclic manner, characterized in that each cycle comprises a number of steps which, starting with a first adsorption zone wherein impurities have been adsorbed and the adsorption zone has become exhausted, comprise:

expanding a gaseous phase which is present in a void space of said first adsorption zone via the outlet thereof while the inlet thereof is closed;

introducing said expanded gas into an outlet of a regenerated adsorption zone until pressure equalization in both said regenerated and said first zones is obtained;

further expanding said gas present in said void space of said first adsorption zone through said outlet thereof;

introducing said further expanded gas into a packed column filled with an inert, non-porous packing material of high void fraction;

removing said further expanded gas from said voids in said column in a reverse direction by introducing a second further expanded gas from a second exhausted adsorption zone into an opposite end of said packing column;

introducing said removed gas either into a second regenerated adsorption zone via its outlet to partially pressurize the same or into said first adsorption zone for purging said first adsorption zone;

introducing a product quality gas from a product quality gas stream into said outlet of said first adsorption zone while said inlet thereof is closed until a pressure in said first adsorption zone is equal to a pressure of said product gas stream; and

passing said hydrogen containing gas mixture containing said impurities into said inlet of said first adsorption zone and out of said outlet of said first adsorption zone.

4,350,501

ABSORPTION PROCESS

Robert P. Bannon, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 27, 1981, Ser. No. 248,638
Int. Cl.³ B01D *53/04;* **C10G** *25/03*
U.S. Cl. 55—26 **8 Claims**

1. An improved process for using at least four molecular sieve adsorbent beds to effect the resolution of a continuous flow of a vapor-phase hydrocarbon feed mixture containing normal paraffins and non-normal-paraffin hydrocarbons into an adsorbate product fraction comprising normal paraffins and a raffinate product fraction comprising non-normal-paraffin hydrocarbons, which process comprises repeated sequential performance of the following steps:

step one, in which

the feed mixture is passed through a first adsorbent bed,

effluent is withdrawn from the first bed and passed through a second adsorbent bed

a major portion of a continuous flow of an eluent is passed through a third adsorbent bed,

a minor portion of the continuous flow of the eluent is passed through a fourth adsorbent bed,

adsorbate product is withdrawn as effluent from the third bed and from the fourth bed, and

raffinate product is withdrawn as an effluent from the second bed;

step two, in which

the feed mixture is passed through the second bed,

a major portion of the eluent flow is passed through the third bed,

a minor portion of the eluent flow is passed through the first bed,

effluent is withdrawn from the first bed and is passed through the fourth bed,

adsorbate product is withdrawn as effluent from the third bed, and

raffinate product is withdrawn as effluent from the second bed and from the fourth bed;

step three, in which

the feed mixture is passed through the second bed,

effluent is withdrawn from the second bed and passed through the third bed,

a major portion of the eluent flow is passed through the first bed,

a minor portion of the eluent flow is passed through the fourth bed,

adsorbate product is withdrawn as effluent from the first bed and from the fourth bed,

raffinate product is withdrawn as an effluent from the third bed;

step four, in which

the feed mixture is passed through the third bed,

a major portion of the eluent flow is passed through the first bed,

a minor portion of the eluent flow is passed through the second bed,

effluent is withdrawn from the second bed and is passed through the fourth bed,

adsorbate product is withdrawn as effluent from the first bed, and

raffinate product is withdrawn as effluent from the third bed and from the fourth bed;

step five, in which

the feed mixture is passed through the third bed,

effluent is withdrawn from the third bed and passed through the first bed,

a major portion of the eluent flow is passed through the second bed,

a minor portion of the eluent flow is passed through the fourth bed,

adsorbate product is withdrawn as an effluent from the second bed and from the fourth bed,

raffinate product is withdrawn as an effluent from the first bed; and

step six, in which

the feed mixture is passed through the first bed,

a major portion of the eluent flow is passed through the second bed,

a minor portion of the eluent flow is passed through the third bed,

effluent is withdrawn from the third bed and is passed through the fourth bed,

adsorbate product is withdrawn as effluent from the second bed, and

raffinate product is withdrawn as effluent from the first bed and from the fourth bed.

4,350,502

METHOD AND APPARATUS FOR DECONTAMINATING GAS VENTED FROM LAND FILL AND FUGITIVE SOURCES

Joseph A. Spatola, 2431 Bryant Ave., Westfield, N.J. 07090

Filed Sep. 30, 1980, Ser. No. 192,472
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—74 **17 Claims**

1. A system for removing contaminants from a gas stream vented from a land fill or other fugitive gas source which comprises in combination:

at least one vent pipe interposed to channel gas from said land fill or other fugitive gas source;

a housing enclosing at least one wire mesh tube substantially spaced apart from the inner wall of the housing to form a chamber surrounding said wire mesh tube;

said chamber being packed with adsorbing material having a minimum cross-sectional dimension which exceeds the interstices of said wire mesh;

said chamber being closed at the ends except for openings to accommodate at least one said wire mesh tube and openings for removing and replacing said adsorbing material;

means for supporting said housing so that at least one said wire mesh tube is maintained at one of its ends in coupled relation to receive a gas stream in flow from at least one said vent pipe;

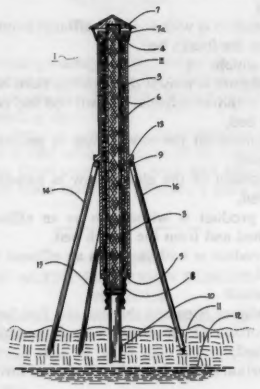
the other end of said wire mesh tube communicating with means protruding through the upper surface of said housing for directing said gas stream into the atmosphere after one or more passes through at least one said wire mesh

tube, whereby said contaminants are radially diffused through the interstices of said wire mesh tube to become adsorbed onto said adsorbing material while the remainder of said gas stream passes in axial direction through said at least one wire mesh tube without substantial contact with said adsorbing material.

11. The method of removing contaminants from gas vented from a land fill or other fugitive gas source which comprises the steps of:

interposing adjacent one or more vent pipes from said land fill or other fugitive gas source, a housing enclosing at least one wire mesh tube substantially spaced-apart from the inner wall of said housing to form a chamber;

packing said chamber surrounding at least one said wire



mesh tube with a bed of adsorbing material having a minimum cross-sectional dimension which substantially excceds the interstices of said at least one wire mesh tube;

coupling said at least one wire mesh tube to at least one corresponding vent pipe for receiving a stream of gas vented in laminar flow from said land fill or other fugitive source for at least one pass through said wire mesh tube, whereby said contaminant is diffused radially, passing through the interstices of said wire mesh tube and becoming adsorbed into said adsorbing material, and whereby the remainder of the gas in said stream passes axially along said at least one wire mesh tube making substantially no contact with said adsorbing material; and

venting the stream of gas to the atmosphere after at least one pass through said at least one wire mesh tube.

4,350,503

FLUID FLOW METERING DEVICE

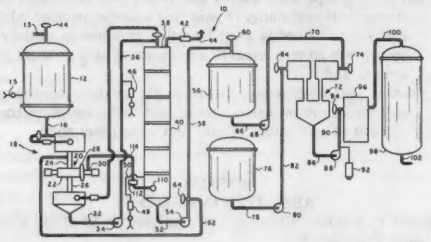
Sigmund P. Skoli, Elmwood Park; David M. Kemp, Naperville, and Harry G. Mojonnier, River Forest, all of Ill., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 151,393, May 13, 1980, abandoned. This application Aug. 24, 1981, Ser. No. 295,643

Int. Cl.³ B01D *19/00*; A23L *2/00*

U.S. Cl. 55—165 **5 Claims**

1. A system for processing a carbonated beverage or the like from water and a beverage concentrate, the system including a vessel for storing a quantity of water, a deaerator for removing air from the water and having a top within which the water is deoxygenated and a bottom within which the deoxygenated water is collected, a fluid flow metering device for controlling the rate of flow of water from the storage vessel to the deaerator and responsive to the water flow rate demand of the deaerator, the fluid flow metering device comprising an inlet conduit, an outlet conduit, a valve block interposed between the inlet and outlet conduits, the valve block defining a through channel providing fluid communication from the inlet conduit to the outlet conduit, a valve element-accepting bore communicating with the through channel and extending substantially normally thereto in two mutually opposed directions, and an infinitely adjustable valve selectively projectable into the valve block channel, the valve including a first fluid flow valve element within said bore and projectable into said channel, vernier adjustment means coupled to the first element for infinitely adjusting the distance in which the first element projects into the channel for establishing a maximum effective fluid flow dimension of the channel, and a second valve element within said bore and disposed oppositely to said first valve element for additionally varying the effective fluid conducting dimensions of the channel to amounts less than the maximum effective fluid flow; the system further including control means for moving the second valve element responsive to the amount of water in the deaerator bottom, the control means including an air-filled line extending from the deaerator bottom to the fluid flow metering device, a float carried in the



deaerator bottom for sensing the height of water in the deaerator bottom, an air valve connected to the float and the air filled line for infinitely and continuously varying pressure in the air line in response to variations in the position of the float, an air-tight chamber at the valve in pressure-sensitive communication with the air-filled line, a portion of the chamber being defined by a diaphragm connected to the second valve element, a spring biasing element acting to urge the diaphragm and connected second valve elements into retracted positions wherein the maximum effective flow rate determined by the first element is permitted, variations in air pressure within the air line and connecting chamber acting to move the diaphragm and second valve element away from their retracted positions against the influence of the spring biasing element so as to infinitely and continuously vary the positions of the second valve element and correspondingly infinitely and continuously reductively vary the effective fluid flow rate through the metering device from the set maximum flow rate.

4,350,504

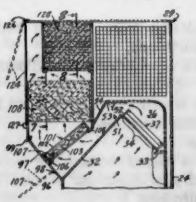
AIR CLEANING SYSTEM

Wolodymyr Diachuk, Minneapolis, Minn., assignor to Century 21 Pollution Control, Inc., Minneapolis, Minn.

Filed Jan. 28, 1980, Ser. No. 116,222

Int. Cl.³ B01D *46/42*, *46/52*, *50/00*, *53/34*

U.S. Cl. 55—217 **18 Claims**



1. An air cleaning apparatus comprising:

a housing having a passage, an air inlet and air outlet in communication with the passage, means located in said passage for moving air through the passage, said air moving through the inlet and being discharged through the outlet,

air pre-filter means located in the passage adjacent in inlet for removing particulates from the air moving through the pre-filter means,

primary filter means located in the passage downstream from the pre-filter means for removing additional particulates from the air moving through said primary filter means,

secondary filter means including charcoal bed filter means located in the passage downstream from the primary filter means for removing additional particulates from the air moving through the charcoal bed filter means, and, an oxidizer medium located in the passage downstream from the charcoal bed filter means to remove odors from the air moving therethrough,

high efficiency filter means located in the passage downstream from the secondary filter means for removing small particulates from the air moving through said high efficiency filter means,

damper means for closing said passage, said damper means being located between the pre-filter means and the secondary filter means, and,

control means for holding the damper means open to permit air flow through the passage, said control means including temperature responsive elements for closing the damper means to prevent the flow of air through the passage.

4,350,505

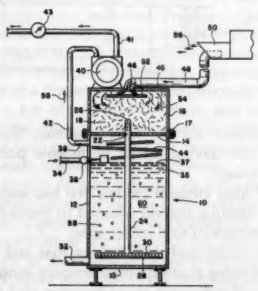
DEVICE FOR REDUCTION OF OXYGEN CONTENT IN DRILLING FLUID

Harvey E. Mallory, Tulsa, Okla., and James W. Ward, Riqua, United Arab Emirates, assignors to Loffland Brothers Company, Tulsa, Okla.

Division of Ser. No. 751,255, Dec. 17, 1976, Pat. No. 4,136,747. This application Aug. 28, 1978, Ser. No. 937,554

Int. Cl.³ B01D *47/02*

U.S. Cl. 55—227 **1 Claim**



1. A device for treating gases containing nitrogen for utilizing the nitrogen for reduction of oxygen content in well bore drilling fluids and comprising housing means, a chamber provided in said housing means and having a suitable filter material disposed therein to provide a filter chamber, a chamber provided in said housing means below said filter chamber and having a suitable liquid disposed therein to provide a liquid bath chamber, a stand-pipe means disposed in said housing means and providing communication between said filter chamber and said liquid bath chamber, level control means for controlling the level of the liquid bath in said liquid bath chamber, first discharge means in communication with said liquid bath for discharge of said liquid bath, second discharge means in communication with the liquid bath chamber and disposed above the upper level of the liquid bath, means disposed in said liquid bath chamber and disposed above the upper level of the liquid bath to provide a tortuous path of travel between the liquid bath and the second discharge means, inlet means providing access to the interior of said filter chamber for admitting the nitrogen containing gases thereto, and means operably connected with said second discharge means for creating a suction within said housing means for pulling said gases through the filter chamber and liquid bath for removing unwanted debris from the gases and discharging clean gases from said device, and including spreader plate means disposed in said filter chamber for dispersing the exhaust gases upon initial entry thereof into the filter chamber.

4,350,506

WASHING DEVICE

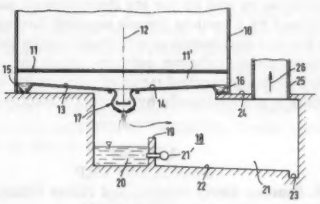
Eberhard Otto, Möglingen, Fed. Rep. of Germany, assignor to Otto Durr Anlagenbau GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 5, 1981, Ser. No. 231,680

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1980, 3042464

Int. Cl.³ B01D *47/10;* **F23J** *11/00*

U.S. Cl. 55—241 **25 Claims**



1. A washing device for washing solid and/or liquid particles out of gases, particularly out of exhaust air from enamel-spraying chambers, comprising a housing adapted to be positioned below the spraying chamber; partition means in said housing dividing the housing into a first chamber filled with washing fluid and a second underpressure chamber; and nozzle means arranged in said partition means between said first chamber and said second chamber, said nozzle means including a casing having an inlet communicating with said first chamber and positioned to receive and atomize the washing fluid and also to receive a gaseous mixture to be washed, and an outlet communicating with said second chamber so that a flow of the particle-containing gaseous mixture is drawn through the atomized washing fluid and through said outlet, said casing having an axis of symmetry and being bounded by two opposite faces and including an uppermost portion widening relative to said axis of symmetry and defining said inlet, an intermediate portion narrowing relative to said axis, a lower portion widening relative to said axis, and a lowermost portion narrowing with respect to said axis and defining said outlet, said uppermost portion merging directly into said intermediate portion, said intermediate portion merging into said lower portion, and said lower portion merging into said lowermost portion so that said portions define a cross-section of said casing having a bell-like configuration to thereby provide for optimum distribution of the atomized washing fluid.

4,350,507

RESPIRABLE PARTICLE SAMPLING INSTRUMENTS

George K. Greenough, and Richard C. Brown, both of Sheffield, England, assignors to National Research Development Corporation, London, England

Filed Mar. 3, 1981, Ser. No. 240,166

Claims priority, application United Kingdom, Mar. 4, 1980, 8007385

Int. Cl.³ B01D *50/00*

U.S. Cl. 55—270 7 Claims

1. A respirable particle sampling instrument comprising a housing defining an air passageway therethrough, an electric fan mounted in said passageway to draw and pass air into and through said passageway, a main filter located across said passageway to collect respirable particles borne by said air passing therethrough, and a pre-filter located across said passageway upstream of said main filter to collect non-respirable particles borne by said air passing therethrough, said pre-filter being formed by a random fibrous network having interstices of such size and distribution as to capture a major proportion of the non-respirable airborne particles in an air flow therethrough within a prescribed range of velocity for which particle capture is predominantly by intertial impaction.

4,350,508

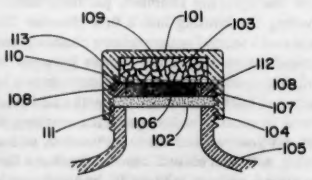
DESICCANT CAP

Dario S. Santoro; Garry Schultz, and Henry Miano, all of 231 Mt. Pleasant, Hauppauge, N.Y. 11788

Filed Dec. 21, 1981, Ser. No. 332,556

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—275 5 Claims



1. A desiccant cap for a container, comprising:

(a) a transparent, substantially nonporous plastic enclosure means having a generally cylindrical cavity with a closed end, the cavity being formed about a reference axis of revolution, and the cavity being partially threaded internally begining about its open end to accept and seal an opening in the container having mating external threads, the threads within the cavity extending into the cavity, but terminating before reaching the closed end of the cavity,

(b) a mixture of desiccant and a humidity sensitive color indicator placed within the cavity adjacent the closed end beyond the termination of the threads, the color indicator being visible through the enclosure walls to indicate the humidity level within the cavity and container,

(c) a shoulder extending inwardly of and completely about the periphery of the cavity wall adjacent the termination of the threads, the shoulder providing a bearing surface positioned adjacent the termination of the threads, generally orthogonal to the reference axis of revolution, and facing the open end of the cavity, and

(d) a generally disc shaped barrier means with a diameter generally equal to that of the cavity, the barrier means formed of a wicking polymer and having a central area filter containing fine through pores, the barrier means being positioned within the cavity abutting and sealed to the bearing surface of the shoulder to separate the mixture of desiccant and humidity sensitive color indicator from the container and its contents, while permitting water vapor from the container to pass through the pores to maintain a dry atmosphere within the container and actuate the color indicator to indicate the level of humidity absorbed from the container, the extraction of water vapor from the container through the pores being aided by the characteristic of the wicking polymer.

4,350,509

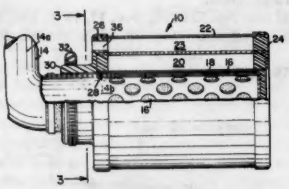
DISPOSABLE AIR CLEANER

Steven M. Alseth, Bloomington, and Bruce M. Sullivan, Burnsville, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Jul. 24, 1981, Ser. No. 286,475

Int. Cl.³ B01D *46/02, 46/52, 50/00*

U.S. Cl. 55—337 10 Claims



1. An air cleaner for use with a tubular, fluid permeable, rigid intake tube having an air permeable portion, said air cleaner comprising:

a. a tubular filter element having first and second ends, and an inner opening therein adapted to receive said air permeable portion of said intake tube;

b. an outer cylindrical shell having first and second ends, said shell being located concentrically around said filter element and defining a space between said shell and said element;

c. a first end cap affixed to and forming a fluid tight junction with each of said first ends of said filter element and said shell;

d. a second end cap affixed to and forming a fluid tight junction with each of said second ends, said second cap having an aperture aligned with said inner opening and adapted to receive said intake tube;

e. at least one intake aperture in at least one of said end caps located to place said defined space in fluid communication with air outside the air cleaner;

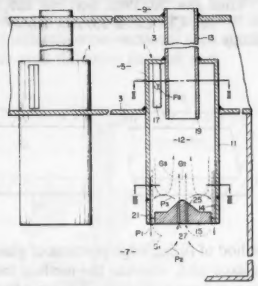
f. a tubular flange extending from said second end cap at the periphery of said second end cap apaerture; and

g. compression means for compressing said flange to reduce the diameter of said flange.

4,350,510
CENTRIFUGAL SEPARATOR

Isao Hamada; Hiroshi Nakayama; Nobuyoshi Kawakami; Hirotaka Azami; Tadasu Ikeda, all of Hitachi; Yasumasa Yukawa; Hiroshi Mitani, both of Kurashiki; Takashi Ohmori, Yokohama; Masanobu Kimura, Kurashiki, and Kohichi Seno, Chofu, all of Japan, assignors to Hirachi, Ltd. and Nippon Mining Co., Ltd., both of Tokyo, Japan

Filed Dec. 12, 1980, Ser. No. 215,843
Claims priority, application Japan, Dec. 12, 1979, 54-160241
Int. Cl.³ B01D *45/12*
U.S. Cl. 55—349 **9 Claims**



1. A centrifugal separator for separating particles from fluid by centrifugal force, which comprises:

housing means for defining a centrifugation chamber;

fluid inlet means provided in the upper portion of said housing means for introducing a fluid containing particles into said centrifugation chamber so as to whirl the fluid;

clean fluid discharging means provided on the upper portion of said centrifugation chamber so that the end portion thereof projects coaxialy within said centrifugation chamber;

guide means provided in the lower portion of said centrifugation chamber, said guide means comprising a flat portion and a guide portion surrounded by said flat portion and projecting into said centrifugation chamber from a central portion of said guide means for guiding the fluid flowing toward the guide portion and to direct said clean fluid to the discharging means, said projecting guide portion being of a diameter which continuously reduces from a base to a top of said guide portion, and having at least one inner fine passage extending axially through a central portion of said guide portion for communication of said centrifugation chamber and the outside;

an annular groove formed between an inner surface of said centrifugation chamber and an outer portion of said guide means, and opened to said centrifugation chamber for trapping particles in the whirled fluid; and

outer passage in said annular groove for discharging the trapped particles with part of the fluid out of said centrifugation chamber, said outer passage having a width substantially equal to the width of said groove to substantially span same.

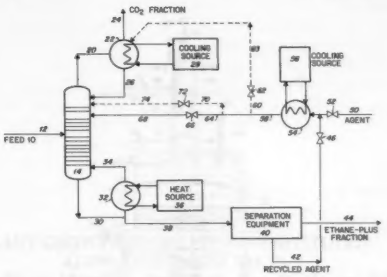
4,350,511
DISTILLATIVE SEPARATION OF CARBON DIOXIDE FROM LIGHT HYDROCARBONS

Arthur S. Holmes, Shrewsbury, and James M. Ryan, Weston, both of Mass., assignors to Koch Process Systems, Inc., Westboro, Mass.

Continuation-in-part of Ser. No. 131,416, Mar. 18, 1980, abandoned. This application Sep. 28, 1981, Ser. No. 306,419
Int. Cl.³ F25J *3/04*
U.S. Cl. 62—17 **24 Claims**

1. In a method for the distillative separation in a distillation column of a feed stream comprising carbon dioxide and a light hydrocarbon component in a mixture, to provide a carbon-dioxide-enriched overhead product and a light hydrocarbon-enriched bottoms product, including the operation of a distillation column under conditions of temperature, pressure and composition sufficient to form a binary azeotrope between the carbon dioxide and a light hydrocarbon component, which azeotrope limits the concentration of the carbon dioxide in the overhead product withdrawn from said column, the improvement which comprises:

adding to the upper portion of the distillation column and above the point of introduction of the feed stream, a liquid agent which significantly alters the relative volatility

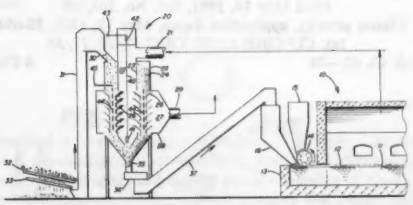


between said carbon dioxide and said light hydrocarbon component and prevents the azeotrope formation therebetween, the liquid agent added in an amount of greater than about 10 mol percent based on the mols of liquids in the column at or below the point of introduction of the liquid agent and sufficient to provide a relative volatility of greater than one of the said carbon dioxide to the said light hydrocarbon component at or below the point of introduction of the liquid agent, which provides a carbon-dioxide-enriched overhead product having a carbon dioxide concentration greater than the carbon dioxide concentration of the binary azeotrope.

4,350,512
GLASS MELTING METHOD USING CULLET AS HEAT RECOVERY AND PARTICULATE COLLECTION MEDIUM

John F. Krumwiede, Blawnox, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 31, 1981, Ser. No. 249,310
Int. Cl.³ C03B *3/00*
U.S. Cl. 65—27 **14 Claims**



1. In a method of melting glass wherein raw glass batch materials and cullet are fed into a fuel fired melting furnace, and an exhaust gas discharge that includes waste heat is passed from the furnace, the improvement comprising: passing a stream of the exhaust gas prior to discharge to the atmosphere through a bed of cullet so as to heat the cullet, and removing cullet from the cullet bed and feeding the removed cullet while in a heated state to the melting furnace in a stream separate

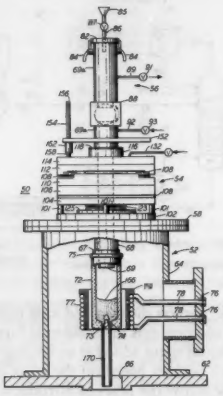
from the stream of raw glass batch materials being fed to the furnace.

4,350,513

METHOD AND APPARATUS FOR EXTRUDING GLASS TUBES

Alexander Coucoulas, Bridgewater Township, Somerset County, and Carroll D. Spainhour, Princeton Township, Mercer County, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 23, 1981, Ser. No. 324,336
Int. Cl.³ C03B *15/14*
U.S. Cl. 65—29 **5 Claims**



1. A method of substantially eliminating the bend in a tube that is extruded from a glass melt in a crucible heated by heating means surrounding and spaced from said crucible, the method comprising the steps of:

monitoring the bend of the extruded tube exiting the crucible; and

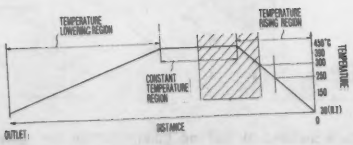
moving the crucible relative to the heating means, in the direction of the bend, to straighten the tube within predetermined limits in response to said monitoring means.

4,350,514

METHOD FOR MANUFACTURING CATHODE RAY TUBES

Masatoshi Akiyama, Yotsukaidomachi; Shigeki Kitamura, Mobara; Junichi Tetsu, Mobara, and Koichi Nakazato, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 14, 1981, Ser. No. 263,709
Claims priority, application Japan, May 19, 1980, 55-65406
Int. Cl.³ C03B *23/20*; C03C *17/22, 17/38*
U.S. Cl. 65—36 **6 Claims**



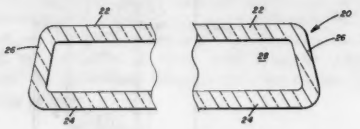
1. In a method of manufacturing a cathode ray tube including a panel having an inner wall coated with a phosphor film an organic film and a metallic reflective film; comprising the step of fusing said panel with a funnel with its inner surface coated with an electroconductive film, said fusing step being carried out by successively passing through a baking furnace a plurality of tube assemblies each comprising an assembly of a funnel and a panel with frit glass interposed therebetween, the improvement wherein oxygen containing gas is forced into said baking furnace during said fusing step said oxygen containing gas being in an amount sufficient to prevent depletion of oxygen due to decomposition of the organic film.

4,350,515

METHOD OF PRODUCING GLASS EDGE MULTIPLE GLAZED UNITS

John L. Stewart, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 30, 1981, Ser. No. 229,710
Int. Cl.³ C03B *23/203, 23/24*
U.S. Cl. 65—40 **10 Claims**



1. In a method of fusing edge portions of glass sheets to form a multiple glazed unit, wherein the method includes the steps of positioning at least two sheets having adjacent major surfaces in face-to-face relation; heating the marginal edge portions of at least one of the sheets to form a weld which unites edge portions of the sheets; and drawing the sheets apart to provide a spaced distance between adjacent major surfaces of the sheets, the improvement comprising:

increasing the time period between the end of the heating step and the start of the drawing step; and

cooling the welded edge portions of the sheets during said increasing step to produce a substantially uniform temperature condition in a fillet-forming body of fused glass to provide a multiple glazed unit having fillets of substantially uniform thickness about the periphery thereof after the practice of the drawing step.

7. The method as set forth in claim **1** or **2** wherein the marginal edge heating step is practiced using electrical currents.

8. The method as set forth in claim **7** wherein the marginal edge heating step comprises the steps of:

applying a continuous volatilizable electroconductive stripe to the marginal edge portions of at least one of the sheets;

passing an electrical current through the stripe to heat the marginal edge portions of the at least one sheet to a temperature where the marginal edge portions of the at least one sheet become appreciably electroconductive; and

passing an electrical current through the electroconductive marginal edge portions of the at least one sheet to heat adjacent portions of the other of the sheets to a temperature above a fusing temperature to unite the marginal edge portions of the at least one sheet and the heated portions of the other sheet.

4,350,516

OUTLET FOR A GLASS MELTING FURNACE

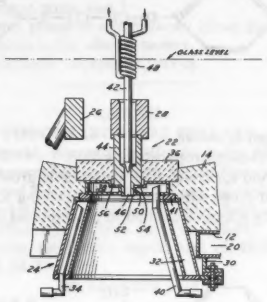
Duane H. Faulkner, Battle Creek, Mich., and Vaughn C. Chenoweth, Hollansburg, Ohio, assignors to Guardian Industries Corporation, Northville, Mich.

Filed Feb. 13, 1981, Ser. No. 234,274
Int. Cl.³ C03B *5/26*
U.S. Cl. 65—327 **5 Claims**

1. In a furnace for melting glass or other high melting point materials, characterized by a refractory-lined vessel having a heat source for melting a charge of material placed within a melting zone within the vessel and outlet means establishing a channel through which molten material can flow from the melting zone through the vessel lining and wall to the exterior

of the vessel, the improved outlet means construction which comprises:

an orifice block formed of a single integral block of high melting point refractory material having an orifice through which the molten material may flow, the inner end of the orifice block extending into the melting zone within the vessel where such end of the block is directly in contact with and exposed to the heat of the molten charge, the inner end of said orifice being subjected to the eroding effect of molten material contacting said block as it flows through said orifice, said block extending through the vessel lining and wall so that its outer end is exposed to normal atmosphere on the exterior of the furnace, the portions of the orifice block at and adjacent to its outer end having a minimal cross-sectional area consistent with minimum safe wall-thickness thereof; and



a cooling jacket surrounding and intimately contacting said minimal cross-sectional area portions at and adjacent to the outer end of said orifice block, said cooling jacket receiving a circulating flow of cooling fluid to reduce the temperature of the outer end of said orifice block below the point at which such block would oxidize.

3. The furnace of claim 1 wherein said outer end portions of said orifice block are cylindrical in cross-section, the outside diameter thereof abruptly changing at a position intermediate the ends of said block to define an outer end portion of minimal diameter to provide said minimal cross-sectional area and an intermediate portion of substantially greater diameter, said change in diameter creating a shoulder surface area interconnecting said outer end portion and said intermediate portion, said cooling jacket surrounding and intimately contacting the full peripheral surface of said outer end portion and said shoulder surface of said orifice block.

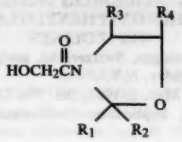
4,350,517

HYDROXYACETYL OXAXOLIDINE HERBICIDAL ANTIDOTES

Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 143,665, Apr. 25, 1980, Pat. No. 4,269,986.
This application Dec. 22, 1980, Ser. No. 219,277
Int. Cl.³ A01N *43/76*; C07D *263/06*
U.S. Cl. 71—88 **6 Claims**

1. A method of controlling undesirable vegetation while reducing herbicidal injury due to thiolcarbamate herbicides to crops which comprises adding to the soil an antidotally effective amount of a compound of the formula



in which R_1–R_4 are each independently selected from the group consisting of hydrogen and alkyl having 1–4 carbon atoms.

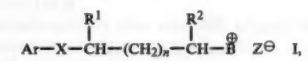
4,350,518

PLANT GROWTH REGULATING SUBSTITUTED ALKYLAMMONIUM SALTS

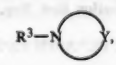
Hubert Sauter, Mannheim; Bernd Zeeh; Ernst Buschmann, both of Ludwigshafen, and Johann Jung, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 130,450, Mar. 14, 1980, abandoned.
This application Feb. 23, 1981, Ser. No. 236,812
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913523
Int. Cl.³ A01N *43/46, 43/40*; C07D *295/08*
U.S. Cl. 71—88 **5 Claims**

1. A substituted alkylammonium salt of the formula



where Ar denotes phenyl substituted by trifluoromethyl or cyano, or by 2 to 3 indentical or different substituents selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, alkoxy, trifluoromethyl, alkylcarbonylamino, alkylsulfonyl, alkylaminosulfonyl, dialkylaminosulfonyl, all of a maximum of 6 carbon atoms, fluoro, chloro, bromo, iodo, cyano, aminosulfonyl, phenyl and benzyl, X denotes oxygen or sulfur, n denotes one of the integers 0, 1 and 2, R^1 and R^2 are identical or different and each denotes hydrogen or C_1–C_4-alkyl, B denotes



Y denoting a $-(CH_2)_4-$, $-(CH_2)_5-$, $-(CH_2)_7-$ group which is unsubstituted or substituted by from 1 to 3 identical or different radicals selected from the group consisting of C_1–C_4-alkyl, C_1–C_4-alkoxy, chloro, bromo, hydroxy and cyano, and R^3 denoting linear or branched C_1–C_6-alkyl, C_2–C_6-alkenyl or C_2–C_6-alkynyl, each of which is unsubstituted or substituted by halogen, hydroxy, cyano, C_1–C_4-alkoxy or C_1–C_4-alkylcarbonyl, and Z denotes the anion of any non-phytotoxic acid HX.

5. An agent for regulating plant growth, comprising a solid or liquid carrier, and an effective amount of a compound of claim 1.

4,350,519

HERBICIDALLY ACTIVE 2-NITRO-5-PHENOXYPHENYLOXAZOLES AND -OXAZOLINES

Dieter Dürr, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

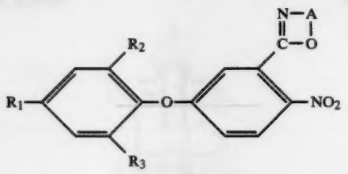
Filed Mar. 2, 1981, Ser. No. 239,721

Claims priority, application Switzerland, Mar. 5, 1980, 1739/80

Int. Cl.[3] A01N *43/00;* C07C *263/14*

U.S. Cl. 71—88 15 Claims

1. A compound of the formula



wherein A is ethylene or vinylene optionally substituted by C_1–C_4 alkyl or C_1–C_4 haloalkyl, and each of R_1, R_2 and R_3 is hydrogen, halogen, trifluoromethyl, nitro or cyano.

11. A herbicidal and plant growth inhibiting composition which contains, as active component, a herbicidally or plant growth inhibiting effective amount of at least one compound according to claim 1, and an inert carrier.

12. A method of controlling undesired plant growth at a locus, which comprises applying to said locus a herbicidally effective amount of a compound according to claim 1.

13. A method of selectively controlling weeds in crops of useful plants, which comprises applying thereto a herbicidally effective amount of a compound according to claim 1.

4,350,520

PLANT GROWTH REGULANT COMPOSITIONS

Gunther Beck; Helmut Heitzer, both of Leverkusen, and Klaus Lürssen, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

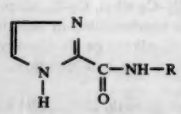
Filed Dec. 5, 1980, Ser. No. 213,704

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951201

Int. Cl.[3] A01N *43/50*

U.S. Cl. 71—92 8 Claims

1. Method of promoting the growth of sugar beets, which method comprises applying to the plants or their habitat an effective amount of an imidazole-2-carboxylic acid amide compound of the formula



(I)

wherein R is alkyl with 1 to 18 carbon atoms.

4,350,521

HERBICIDAL α-[4-(3',5'-DICHLOROPYRID-2'-YL)-OXY]-PHENOXY-PROPIONIC ACID γ-BUTYROLACTONE ESTER AND THIOESTER

Beat Böhner, Binningen, and Hermann Rempfler, Ettingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

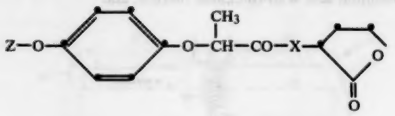
Division of Ser. No. 106,797, Dec. 26, 1979, Pat. No. 4,284,566. This application Mar. 9, 1981, Ser. No. 241,808

Claims priority, application Switzerland, Jan. 4, 1979, 52/79

Int. Cl.[3] A01N *43/40;* C07D *239/72*

U.S. Cl. 71—94 5 Claims

1. An α-phenoxy-propionic acid-γ-butyrolactone ester or thioester of the formula I



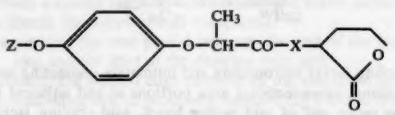
(I)

wherein

X is oxygen or sulfur,

Z is the 3,5-dichloropyridyl-2 group.

5. A method for controlling undesirable growth in cultures of cultivated crops which comprises applying to said cultures a herbicidally effective amount of a compound of the formula



(I)

wherein X is oxygen or sulfur, and Z is 3,5-dichloropyridyl-2.

4,350,522

HERBICIDAL 4-TRIFLUOROMETHYL-4'-NITRODIPHENYL ETHERS

Horst O. Bayer, Levittown, and Colin Swithenbank, Perkasie, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

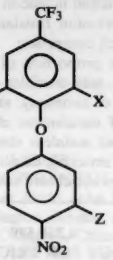
Division of Ser. No. 808,415, Jun. 20, 1977, Pat. No. 4,185,995, which is a division of Ser. No. 617,562, Sep. 29, 1975, Pat. No. 4,046,798, which is a division of Ser. No. 331,719, Feb. 12, 1973, Pat. No. 3,928,416, which is a continuation-in-part of Ser. No. 234,651, Mar. 14, 1972, Pat. No. 3,798,276. This application Sep. 1, 1978, Ser. No. 939,086

The portion of the term of this patent subsequent to Dec. 23, 1992, has been disclaimed.

Int. Cl.[3] C07C *69/78, 43/22;* A01N *37/10*

U.S. Cl. 71—111 28 Claims

1. A herbicidal composition comprising a herbicidally-effective amount of a compound of the formula



wherein
X is a halogen atom,
Y is a hydrogen atom, and
Z is a carboxy group or a carbalkoxy group having up to 4 carbon atoms in the alkoxy moiety,
and an agronomically acceptable carrier.

4,350,523

POROUS IRON ORE PELLETS

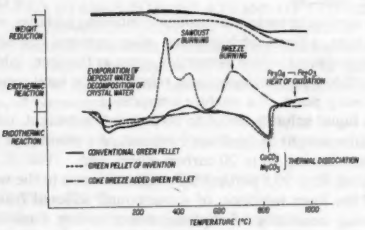
Kazumasa Taguchi, Amagasaki; Hiroshi Isako, Kobe; Koichi Ikeda, Kakogawa; Keisuke Honda, Kasai; Masaru Kanemoto, Kakogawa, and Keishiro Hanaoka, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Apr. 8, 1980, Ser. No. 138,407

Claims priority, application Japan, Apr. 12, 1979, 54/45109; Aug. 28, 1979, 54/110079

Int. Cl.³ C22B *1/14*

U.S. Cl. 75—0.5 R **5 Claims**



1. Porous iron ore pellets, which are obtained by admixing to iron ore a combustible material having a grain size smaller than 2 mm and inflammable at a temperature below 400° C., pelletizing the resulting mixture and burning off said combustible material, said iron ore pellets having a pore size distribution consisting of more than 30% of pores having a diameter of 10 microns to 100 microns and a balance of pores having a diameter smaller than 10 microns, a total porosity greater than 30%, and an FeO content less than 1%.

4,350,524

PROCESS FOR REMOVAL OF BASE METAL IMPURITIES FROM MOLTEN SILVER WITH SULFUR HEXAFLUORIDE

John R. Knoepke, and David B. George, both of Salt Lake County, Utah, assignors to Kennecott Corporation, Salt Lake City, Utah

Filed May 15, 1981, Ser. No. 264,009

Int. Cl.³ C22B *11/02*

U.S. Cl. 75—63 **14 Claims**

1. A process for removing base Metal impurities from silver, comprising the steps of treating a molten bath of metallic silver containing base metal impurities with only that amount of sulfur hexafluoride gas that will form the respective fluorides of said base metal impurities substantially, without alteration of the silver; and removing the resulting base metal fluorides while leaving substantially all of the silver in the molten bath.

4,350,525

MAGNETIC SUSPENSION RAILROAD PARTS

Karl Forch, Hattingen-Blankenstein, Fed. Rep. of Germany, assignor to Thyssen Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Mar. 11, 1981, Ser. No. 242,470

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1980, 3009234

Int. Cl.³ C22C *38/06*

U.S. Cl. 75—124 **2 Claims**

1. A magnetic suspension railroad part, especially a lateral guide rail, adapted to sustain the support, steering and propulsion forces of suspended railroad use, and made of a magnetically soft steel having high magnetic induction and electric resistivity, magnetic aging stability, weather resistance and good weldability, said steel consisting of:
0 to 0.15—% carbon,
0 to 0.045—% phosphorus,
0 to 0.008—% nitrogen,
0.75 to 2.0—% silicon,
0.15 to 1.00—% manganese,
0.02 to 0.07—% aluminum, soluble,
0.25 to 0.55—% copper,
0.65 to 1.00—% chromium,
Remainder—iron with impurities due to melting.

4,350,526

PALLADIUM/SILVER ALLOY FOR USE WITH DENTAL PROCELAINS

Stephen P. Schaffer, Bloomfield, Conn., assignor to The J. M. Ney Company, Bloomfield, Conn.

Filed Aug. 4, 1980, Ser. No. 174,759

Int. Cl.³ C22C *30/06*

U.S. Cl. 75—134 B **4 Claims**

1. A palladium/silver alloy especially adapted for use with dental porcelains consisting essentially of:
A. 45–60 percent by weight palladium;
B. 25–45 percent by weight silver;
C. 3–15 percent by weight of a hardening and oxidizing component selected from the group consisting of tin, indium and mixtures thereof;
D. 0.3–9.0 percent by weight zinc;
E. 0.1–1.0 percent by weight silicon to substantially eliminate discoloration of porcelains fired thereagainst;
F. up to 0.5 percent by weight of a grain refining component selected from the group consisting of rhenium, iridium and mixtures thereof; and
G. up to 5.0 percent by weight of a modifying component selected from the group consisting of copper, magnesium, gallium, ruthenium and mixtures thereof.

4,350,527

GOLD-COLORED, ACID AND CORROSION RESISTANT ALLOY

Daniel Davitz, 8117 Church, Niles, Ill. 60648

Continuation-in-part of Ser. No. 145,425, May 1, 1980. This application Oct. 13, 1981, Ser. No. 310,475

Int. Cl.³ C22C *5/08*

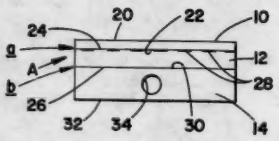
U.S. Cl. 75—173 C **22 Claims**

1. A gold-colored, acid and corrosion-resistant alloy which consists essentially of 15 to 20 weight percent of indium, 7 to 20 weight percent of copper, 5 to 15 weight percent of palladium, and from 0 to 10 weight percent of gold, the balance consisting essentially of silver.

4,350,528
METHOD FOR DIFFUSION BONDING WORKPIECES AND ARTICLE FABRICATED BY SAME

Edgar W. Engle, Rogers, Ark., assignor to TRW Inc., Cleveland, Ohio

Filed Jun. 12, 1980, Ser. No. 158,761
Int. Cl.³ B22F 7/02
U.S. Cl. 75—203 12 Claims



1. A method for diffusion bonding at least a pair of bodies to each other at a bond zone defined at the interface of cooperating surfaces of said bodies disposed in a contacting relationship with each other and wherein each of said bodies is formed of a cemented tungsten carbide material which includes cobalt as a low melting phase component and tungsten carbide as a high melting phase component, said method comprising the steps of:

sintering each of said bodies in an inert atmosphere to a temperature intermediate the melting temperature of said low and high melting phase components thereof to obtain substantially the full density and hardness characteristics for said bodies;

shaping said bodies to have substantially the desired conformations with one of said bodies having a first bond surface and the other of said bodies having a second bond surface, said first and second bond surfaces adapted to substantially mate with each other;

placing said first and second bodies in an assembled relationship with each other so that said first and second bond surfaces are in engagement and define said bond zone; and,

heating said bodies in said assembled condition in an inert atmosphere to a temperature intermediate the melting temperatures of the low and high melting phase components thereof for causing grains in said first and second bodies at least adjacent said first and second bond surfaces to grow across said bond zone and thereby effect an integral interconnection between said bodies.

4,350,529
CORROSION-RESISTANT POWDER-METALLURGY STAINLESS STEEL POWDERS AND COMPACTS THEREFROM

David H. Ro, Cleveland Heights; Erhard Klar, Beachwood, and Charles I. Whitman, Bay Village, all of Ohio, assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 10,956, Feb. 9, 1979, Pat. No. 4,240,831. This application Jun. 20, 1980, Ser. No. 161,552
The portion of the term of this patent subsequent to Dec. 23, 1997, has been disclaimed.
Int. Cl.³ B22F 3/00
U.S. Cl. 75—228 10 Claims

1. In a process for atomizing a melt of metals for producing stainless steel powder, wherein said atomizing is conducted in an oxidizing environment whereby the resulting stainless steel powder is surface-enriched in silicon oxides, the improvement for increasing the corrosion resistance of said powder or a compact thereof which comprises:

adding an effective proportion of modifier metal prior to said atomization, said modifier metal selected from the group consisting of antimony, arsenic, and bismuth, each being capable of enrichment about the surface of said resulting atomized stainless steel powder and effective under reductive sintering conditions in the depletion of said silicon oxides about said surface.

4,350,530
SINTERED ALLOY FOR FRICTION MATERIALS

Nobuo Kamioka, Kasukabe, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Apr. 1, 1980, Ser. No. 136,301
Int. Cl.³ B22F 5/00
U.S. Cl. 75—231 1 Claim

1. A Fe-base sintered alloy friction material comprising 3 to 15% by weight of bismuth, copper in an amount ranging from 10 to 50% by weight of the iron content and tin in an amount ranging from 1/7 to 1/20 by weight of the copper content.

4,350,531
PRINTING PASTES WITH FOAM INHIBITORS

Harry Distler, Bobenheim; Rudi Widder, Leimen, and Guenter Uhl, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 1, 1981, Ser. No. 298,354
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1980, 3033276
Int. Cl.³ C09D 11/02
U.S. Cl. 106—19 8 Claims

1. In a printing paste composition containing a binder, water, a thickener, a foam inhibitor, and other optional ingredients, the improvement which comprises using as the foam inhibitor from 0.05 to 5 percent by weight, relative to the total weight of the printing paste, of a mixture comprising

(a) a liquid solution of 0.1 to 50 percent by weight, relative to the weight of the foam inhibitor, of a monoalkyl phosphate having 10 to 20 carbon atoms; and

(b) from 50 to 99.9 percent by weight, relative to the weight of the foam inhibitor, of a compound selected from the group consisting of aliphatic esters having a molecular weight of 200 to 800, aliphatic hydrocarbons having a boiling point above 100° C., and mixtures thereof.

4,350,532
GLASS COMPOSITION AND ARTICLES

Ronald M. Randklev, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 184,917, Sep. 8, 1980, abandoned. This application Jul. 30, 1981, Ser. No. 288,290
Int. Cl.³ A61K 6/04; C03C 1/04
U.S. Cl. 106—30 4 Claims

1. A single phase glass composition consisting essentially of, in percent by weight:

Zinc oxide	20 to 35%
Silica	45 to 65%
Boric oxide	3 to 15%
Aluminum oxide	0 to 10%
Aluminum fluoride	At least 2%
Alkali metal oxide or alkaline earth metal oxide	0 to 5%

wherein the combined weight of aluminum oxide and aluminum fluoride is in the range of at least about 5%, and wherein

said composition exhibits an X-ray absorption characteristic of at least 1/16 inch.

4,350,533

HIGH EARLY STRENGTH CEMENT

Richard E. Galer, Hanover Park; John R. Blasius, Evanston, and Paul C. Webb, Arlington Heights, all of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Aug. 3, 1981, Ser. No. 289,589

Int. Cl.³ C04B *7/02*

U.S. Cl. 106—89 **21 Claims**

1. A hydratable cement powder which during the early stages of hydration produces an amount of ettringite equal to from about 40% to about 60% of the weight of the cement/water paste, said powder comprising, by weight, from about 18% to about 65% high alumina cement, from about 16% to about 35% calcium sulfate, from 0% to about 65% portland cement, and from 0% to about 8.5% extraneous lime, said portland cement and said extraneous lime being alternative or complementary sources of from about 3.5% to about 8.5% of calcium oxide during hydration of the cement powder.

4,350,534

FLUID, STABLE FORMULATIONS OF COPPER PHTHALOCYANINE OR INDANTHRONE

Wolf D. Fechner, Dirmstein; Joachim Kranz, Ludwigshafen, and Rudolf Polster, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 2, 1981, Ser. No. 279,778

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1980, 3026697

Int. Cl.³ C09B *47/04*

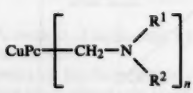
U.S. Cl. 106—288 Q **9 Claims**

1. A fluid, stable formulation which contains

(a) finely divided copper phthalocyanine in the α- or β-modification, or finely divided indanthrone,

(b) one or more C_6-C_{18}-alkylbenzenesulfonic acids,

(c) a basic copper phthalocyanine of the formula:



where CuPc is an n-valent radical of copper phthalocyanine, R^1 and R^2 independently of one another are hydrogen or C_1-C_8-alkyl and n is 1, 2, 3 or 4,

(d) one or more compounds which are obtained by Mannich condensation of 2-hydroxynaphthalene, which may or may not contain 1 or 2 additional β-hydroxyl groups, formaldehyde and primary or secondary aliphatic, cycloaliphatic or aromatic monoamines, diamines, triamines or polyamines or 5-membered or 6-membered heterocyclic compounds which contain an >NH group as a ring member, and which contain from 1 to 6 β-hydroxynaphthyl groups, and

(e) one or more organic liquids, the weight ratio of (b):(c):(d) being from 1:1:1 to 2.5:1.25:1 and the amount of (d) being from 10 to 50% by weight, based on (a).

4,350,535

WATER-DISPERSIBLE PASTE COMPOSITION OF METAL POWDER

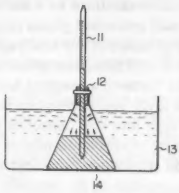
Shizuo Ishijima, Mishima; Takeshi Kiritani, Yokohama, and Yukio Hayashi, Fujinomiya, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed May 22, 1980, Ser. No. 152,294

Claims priority, application Japan, May 28, 1979, 54-65007

Int. Cl.³ C04B *31/40*

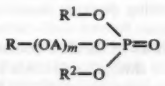
U.S. Cl. 106—308 Q **10 Claims**



1. A water-dispersible paste composition of metal powders comprising:

(a) metal powders, and;

(b) from 0.1 to 20% by weight, based on the weight of the metal powders, of at least one organic phosphoric ester having a general formula:



[I]

where R represents an alkyl group having 6 to 24 carbon atoms, an alkenyl group having 6 to 24 carbon atoms or an aryl group consisting at least one alkyl substituent having 6 to 24 carbon atoms or at least one alkenyl substituent having 6 to 24 carbon atoms, A represents an alkylene group having 2 to 4 carbon atoms, m represents an integer of from 0 to 20, and R^1 and R^2 independently represent hydrogen, an alkyl group having 1 to 24 carbon atoms, an alkenyl group having 1 to 24 carbon atoms, an aryl group having 6 to 24 carbon atoms or R— $(OA)_m$ (R, A and m are the same as set forth above).

4,350,536

METHOD OF PRODUCING DYNAMIC RANDOM-ACCESS MEMORY CELLS

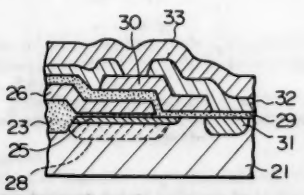
Motoo Nakano, Yokohama, and Tsutomu Ogawa, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 25, 1980, Ser. No. 180,947

Claims priority, application Japan, Aug. 30, 1979, 54-110718

Int. Cl.³ H01L *21/02, 21/18, 21/22, 21/265*

U.S. Cl. 148—1.5 **18 Claims**



1. A method of producing a dynamic random-access memory cell having a capacitor plate and a transfer gate positioned on a semiconductor substrate of a first conductivity type, a shallow doped region of the opposite conductivity type

formed in said substrate to extend under said capacitor plate, and a deeper highly doped region of the first conductivity type formed under said shallow doped region without any portion of said deeper region extending beyond said shallow region from said capacitor plate toward said transfer gate, to avoid the formation of a barrier region between said capacitor plate and said transfer gate, said method comprising the steps of:

forming an oxide layer on said semiconductor substrate;

forming a patterned photo resist layer on said oxide layer;

selectively implanting impurities of said opposite conductivity type into said substrate to form said shallow doped region using said patterned photo resist layer as a mask;

forming a layer of material for said capacitor plate on said oxide layer and said patterned photo resist layer;

in selective order forming a masking layer on said capacitor plate material layer and implanting impurities of the first conductivity type into said capacitor plate material layer, the diffusion rate of said impurities of said first conductivity type in said semiconductor substrate being faster than that of said impurities of the opposite conductivity type,

removing said patterned photo resist layer together with the portions of said masking layer and said capacitor plate material layer formed on said photo resist layer to leave said capacitor plate, and a portion of said masking layer on said capacitor plate,

removing an end portion of said capacitor plate from under an end portion of the remaining masking layer overlaying said capacitor plate by etching;

removing the remaining masking layer remaining on said capacitor plate; and

diffusing said impurities of the first conductivity type from said capacitor plate through said oxide layer and into said semiconductor substrate under said shallow doped region by heating said substrate in an atmosphere containing a predetermined gas to form said deeper highly doped region under said shallow doped region, said removed end portion being such as to prevent said formation of said barrier region as a result of said shallower region extending beyond said deeper region toward said transfer gate.

4,350,537

SEMICONDUCTOR ANNEALING BY PULSED HEATING

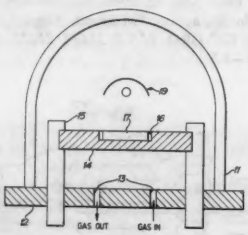
John M. Young, Harlow, and Peter D. Scovell, Chelmsford, both of England, assignors to ITT Industries Inc., New York, N.Y.

Filed Oct. 9, 1980, Ser. No. 195,688

Claims priority, application United Kingdom, Oct. 17, 1979, 7936041; Jul. 29, 1980, 8024758

Int. Cl.³ H01L *21/265, 21/26*

U.S. Cl. 148—1.5 **8 Claims**



1. A method of annealing an ion damaged semiconductor body, including contacting the body with a heater element of low thermal mass, pulse heating the body by raising the temperature of the heater element and the body to 450° to 900° C. so as to effect annealing, and allowing the element and the body to cool.

4,350,538

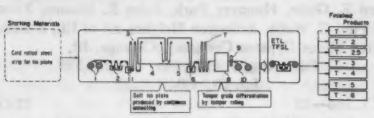
METHOD FOR PRODUCING STEEL STRIP FOR TIN PLATE AND TIN-FREE STEEL PLATE IN VARIOUS TEMPER GRADES

Ichiro Imai, Kitakyusyushi; Takashi Furuya; Narumi Ando, both of Tokyo, and Satoyuki Kitajima, Kitakyusyushi, all of Japan, assignors to Nippon Steel Corporation, Chiyodaku, Japan

Filed Aug. 4, 1980, Ser. No. 175,044

Int. Cl.³ C21D *7/02, 7/04*

U.S. Cl. 148—12 D **2 Claims**



1. A method for adjustment of temper grade in steel strip for use in production of surface-treated plate, particularly tin plate and tin-free steel plate, by temper rolling, which method comprises subjecting a cold rolled strip of low-carbon steel to continuous annealing and subsequently effecting temper-grade differentiation of the steel strip over the entire range of temper grades T-1 through T-6 by subjecting the steel strip to dry temper rolling for obtaining at least some of the temper grades, the dry temper rolling being carried out with a temper rolling mill provided with work rolls 50 to 300 mm in diameter, and subjecting the steel strip to wet temper rolling for obtaining any temper grades not obtained by the dry temper rolling.

4,350,539

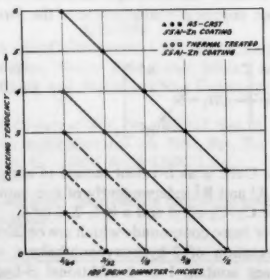
METHOD OF IMPROVING THE DUCTILITY OF THE COATING OF AN ALUMINUM-ZINC ALLOY COATED FERROUS PRODUCT

Theodore E. Torok, Springtown; Paik W. Shin, Coopersburg, and Angelo R. Borzillo, Norristown, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Division of Ser. No. 92,786, Nov. 8, 1979, Pat. No. 4,287,008. This application May 26, 1981, Ser. No. 267,132

Int. Cl.³ B32B *15/01*

U.S. Cl. 148—31.5 **2 Claims**



1. A thermally treated metallic coated ferrous base product having a ductile coating, characterized by an intermetallic layer adjacent said ferrous base and a coating overlay, whereby said overlay (1) comprises by weight, 25 to 70% aluminum, balance essentially zinc with a small addition of silicon, (2) contains precipitates of incoherent, overaged second phase particles, and (3) has a hardness no greater than about 115 VHN.

4,350,540

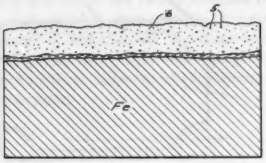
METHOD OF PRODUCING AN ALUMINUM-ZINC ALLOY COATED FERROUS PRODUCT TO IMPROVE CORROSION RESISTANCE

Louis K. Allegra, Bethlehem; Herbert E. Townsend, Center Valley, and Angelo R. Borzillo, Norristown, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Division of Ser. No. 92,787, Nov. 8, 1979, Pat. No. 4,287,009. This application May 26, 1981, Ser. No. 267,134

Int. Cl.³ B32B *15/18*

U.S. Cl. 148—31.5 1 Claim



1. A thermally-treated metallic coated ferrous base product having improved atmospheric corrosion resistance, characterized by a solution treated coating overlay comprised of an aluminum-zinc alloy consisting essentially of by weight 25 to 70% aluminum; a small addition of silicon and the balance zinc and a thin intermetallic layer interposed between said overlay and said ferrous base, whereby the structure of said overlay consists of a fine dispersion of zinc within an aluminum-rich matrix.

4,350,541

DOPING FROM A PHOTORESIST LAYER

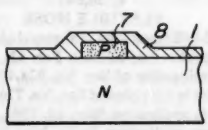
Yoshihiko Mizushima, Fuchu; Akitsu Takeda, Tokyo; Akira Yoshikawa, Higashiyamato; Osamu Ochi, Sayama, and Tomoko Hisaki, Hamuramachi, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp., Tokyo, Japan

Filed Jul. 31, 1980, Ser. No. 174,275

Claims priority, application Japan, Aug. 13, 1979, 54-103051; Aug. 13, 1979, 54-103052

Int. Cl.³ H01L *21/225*

U.S. Cl. 148—188 22 Claims



1. A method of fabricating a semiconductor device comprising the steps of:

forming on the main surface of a semiconductor substrate an inorganic photoresist layer having a first amorphous layer which contains selenium as a matrix component and includes an impurity for providing one conductivity type, and a second layer formed on said first layer, said second layer being a silver or silver-containing layer;

exposing said inorganic photoresist layer with an exposure pattern;

developing the exposed inorganic photoresist layer to form an impurity-containing inorganic photoresist layer having a pattern corresponding to said exposure pattern;

forming a heat resistive overcoating layer on said main surface of said semiconductor substrate, said impurity containing inorganic photoresist layer being covered by said heat resistive overcoating layer; and

forming a doped semiconductor region by diffusing said impurity from said impurity-containing inorganic photoresist layer into a region of said semiconductor substrate underlying said impurity-containing inorganic photoresist layer.

4,350,542

BONDING AGENT FOR HMX (CYCLOTETRAMETHYLENETETRANITRAMINE)

John F. Kincaid, Arlington, Va., and Russell Reed, Jr., Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 31, 1980, Ser. No. 135,563

Int. Cl.³ C06B *45/22, 25/34;* C07D *251/14*

U.S. Cl. 149—11 27 Claims

1. A process for the preparation of a propellant composition having enhanced toughness and improved hazard properties which comprises:

coating an HMX or RDX structure with a material to effect the hydroxyl interaction to the surface of HMX or RDX selected from the group consisting of nitrocellulose, polyhydroxyethyl acrylate and poly-hydroxymethyl acrylate, or mixture thereof;

treating said coated HMX or RDX structure with an amino silane selected from the group consisting of $H_2N(CH_2)_nSi(OR)_3$ wherein n=3 and R=methyl or ethyl; $H_2N(CH_2)_mN(CH_2)_nSi(OR)_3$ wherein n=3 or 4 and m=2 or 3, and R=methyl or ethyl; $H_2N(CH_2)_pN(CH_2)_mN(CH_2)_nSi(OR)_3$ wherein n=3 or 4, m=2 or 3, p=2 or 3, and R=methyl or ethyl; and $H_2N(CH_2)_qN(CH_2)_pN(CH_2)_mN(CH_2)_nSi(OR)_3$ wherein n=3 or 4, m=2 or 3, p=2 or 3, q=2 or 3, and R=methyl or ethyl or mixtures thereof;

reacting said amino silane treated and coated HMX or RDX structure with a primary hydroxyl forming material selected from the group consisting of epsilon caprolactone, glycidol, and ethylene oxide, and

curing said HMX or RDX structure in the presence of a binder and forming a permanent bond between said HMX structure and said binder.

4,350,543

UREA/FORMALDEHYDE ADHESIVES

Ramon Bruguera, Cervello, Spain, assignor to Patentes Y Novedades, S.A., Madrid, Spain

Division of Ser. No. 26,918, Apr. 4, 1979, Pat. No. 4,246,152. This application Jul. 23, 1980, Ser. No. 172,225

Int. Cl.³ B29J *5/00*

U.S. Cl. 156—62.8 2 Claims

1. A process for the production of an agglomerated wooden material comprising binding a particulate wooden material using a urea/formaldehyde adhesive obtained by mixing an inorganic salt with a formaldehyde source, heating the resulting mixture and reacting the resulting mixture with urea to initiate polymerization in an acid medium at a pH between 5 and 6.5, the polymerization reaction being stopped by rendering the reaction mixture alkaline when the mixture has reached a required viscosity and urea being added to the mixture during cooling to give the adhesive after cooling.

4,350,544

METHOD OF MANUFACTURING A PADDED PANEL

Yoshio Matsuno, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 24, 1980, Ser. No. 190,224

Claims priority, application Japan, Sep. 28, 1979, 54-126030

Int. Cl.³ B32B *31/06*

U.S. Cl. 156—79 1 Claim

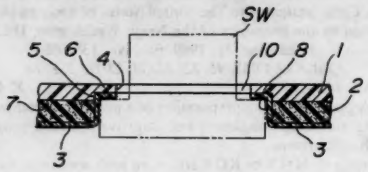
1. A method of manufacturing a padded panel having an opening for mounting a desired article on the panel, comprising the steps of:

forming a groove in the form of a closed loop on a surface of a relatively thick and rigid base plate to form a thin-walled portion around the periphery of said closed loop;

adhering a portion of a relatively thin and flexible surface

layer with the surface of the groove, thus forming a closed space between the base plate and the surface layer;

injecting foamable plastics material into the closed space, and causing the foamable plastics material to foam and harden in the closed space; and



cutting the base plate and the surface layer along the inner periphery of the groove, to thereby form the opening of the panel, while leaving the bottom of the groove as a thin-walled portion around the opening, which affords a seat for positioning and mounting the desired article.

4,350,545

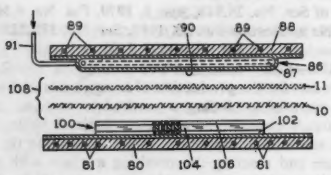
METHOD OF LAMINATING PLASTIC SHEETS

Armen Garabedian, 8-22 Astoria Blvd., New York, N.Y. 11102

Continuation of Ser. No. 84,430, Oct. 12, 1979, abandoned. This application May 18, 1981, Ser. No. 264,954

Int. Cl.³ B32B *31/20*

U.S. Cl. 156—87 **4 Claims**



1. The method of laminating a plurality of layers together comprising, selecting said layers to be laminated such that no more than one of said layers is gas impermeable, also selecting said layers such that at least one thereof is a layer of plastic powder and any other layers are pre-existing gas permeable thermoplastic film or sheet, placing said layers against one another to form an assembly, providing a gas release means on at least one side of said assembly, applying a fluid-like even pressure to said assembly by means of at least one flexible diaphragm which is positioned to exert pressure thereon when flexed by the application of positive or negative pressure thereto, heating said assembly sufficiently while under said fluid-like pressure to fuse said powder to form a continuous integrated ply, venting through said gas permeable layers of said assembly and through said gas release means any gases within or between the layers, said venting taking place at least in part during heating of said assembly, and continuing said heat and pressure for a time and at a temperature sufficient to laminate said layers together.

4,350,546

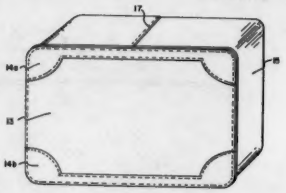
METHOD OF MAKING A COVER FOR A LUGGAGE CASE

Michael Davis, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.

Division of Ser. No. 111,205, Jan. 11, 1980, Pat. No. 4,307,765, which is a continuation of Ser. No. 820,597, Aug. 1, 1977, abandoned. This application Aug. 3, 1981, Ser. No. 289,697

Int. Cl.³ B32B *7/08*

U.S. Cl. 156—93 **2 Claims**



1. A method of making a cover for a luggage case, comprising the steps of:

(a) providing a main cover member of sheet material and substantially rectangular contour with the four corners marginally recessed,

(b) providing two decorative strips of sheet material corresponding in length to the main cover member, each of said strips comprising a central portion of relatively narrow width and end areas in the shape of quadrant sectors,

(c) securing said decorative strips to one face of the main cover member along opposite edges thereof so as to overlie and project beyond the opposite edges with the quadrant sectors overlying the marginal recesses at the corners of the main cover member and provide a single thickness of sheet material around the entire periphery of the main cover member, and

(d) providing a flat strip of sheet material of uniform width and securing it along one edge thereof to the non-recessed areas of the main cover member and to the marginal areas of the decorative strips to form a loop for disposal at a right angle to the main cover member.

4,350,547

FLEXIBLE HOSE

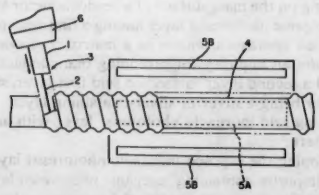
Shiro Kanao, 32-460 Nanpeidai, Takatsuki-shi, Osaka-fu, Japan

Continuation of Ser. No. 120,204, Feb. 11, 1980, abandoned, which is a continuation of Ser. No. 924,409, Jul. 13, 1978, abandoned, which is a division of Ser. No. 776,034, Mar. 9, 1977, abandoned. This application Mar. 19, 1981, Ser. No. 245,292

Claims priority, application Japan, May 13, 1976, 51-54883

Int. Cl.³ B29D *23/12*

U.S. Cl. 156—143 **8 Claims**



1. A method of making a flexible hose having a peripheral rubber wall and a linear reinforcement of rigid resin for reinforcing the rubber wall, which comprises the steps of

selecting a rubber material and a rigid resin material which are approximate to each other in solubility parameter;

integrally extruding a mass of the rubber material in an

uncured state and a mass of the rigid resin material in a molten state to form a composite strip of the rubber material and a linear reinforcement of the rigid resin material which is at least partially embedded in the rubber material and which extends along the length of the strip;

winding the strip helically about a mandrel with rubber side edges of adjacent convolutions of the strip; being disposed in overlapping engagement; and

heating the strip disposed about the mandrel to cure the rubber material of the strip;

whereby the rigid resin material of the reinforcement is effectively bonded to the rubber material over the entire portion of the reinforcement periphery in contact with the rubber material, and adjacent convolutions of the strip are bonded together along the overlapping engaged rubber side edges of these adjacent convolutions, so as to form the flexible hose.

4,350,548

METHOD AND APPARATUS FOR PROVIDING THE INNER SURFACE OF A PIPE LINE WITH A LINING

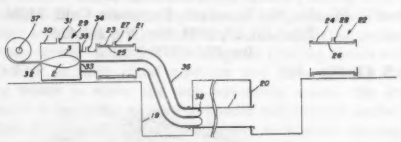
Katsuaki Zenbayashi; Akio Morinaga, both of Fujisawa; Masao Hirayama, and Akira Morita, both of Settsu, all of Japan, assignors to Tokyo Gas Co., Ltd., Tokyo and Ashimori Industry, Co., Ltd., Osaka, both of, Japan

Filed Feb. 13, 1981, Ser. No. 234,861

Claims priority, application Japan, Feb. 18, 1980, 55-19569

Int. Cl.³ B32B *31/20*

U.S. Cl. 156—156 **14 Claims**



1. A method for providing the inner surface of a pipe line with a flexible tubular lining material, said lining material containing a binder material on the internal surface thereof which comprises,

fixing the annular portions of one end of the flexible tubular lining material, at a position in advance of the pipe line,

applying fluid pressure to the rear of the annularly fixed portion of the flexible tubular lining material causing the flexible tubular lining material to be turned inside out at a turning point formed in the tubular lining material,

continuing to apply fluid pressure to the flexible tubular lining material causing the turning point to advance within the pipe line, said fluid pressure also pushing the evanginated tubular lining material against the inner surface of the pipe line, to which it is firmly attached to the aid of the binder material,

providing a flexible hose attached directly or indirectly to the end of the flexible tubular lining material, said flexible hose having a porous structure and a diameter smaller than that of the flexible lining material whereby, upon the continual evagination of the tubular lining material, the flexible hose is drawn into the interior of the pipe line, and

introducing a heated gaseous fluid stream in the form of pressurized steam into the interior of said flexible hose whereby the heated gaseous fluid stream is introduced through the pores of the flexible hose along the inner surface of the pipe line, the flexible tubular lining material being warmed so as to accelerate the curing of the binder interposed between the inner surface of the pipe line and the flexible lining material.

4,350,549

METHOD AND APPARATUS FOR THE PRODUCTION OF HOLLOW BODIES BY WINDING

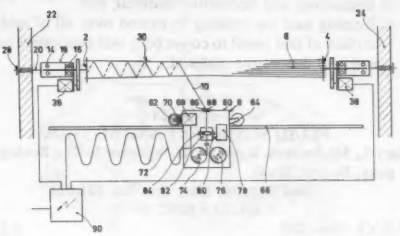
Roland Frehner, Switzerland

Continuation of Ser. No. 881,788, Feb. 27, 1978, abandoned. This application Nov. 28, 1979, Ser. No. 98,314

Claims priority, application Switzerland, Feb. 27, 1977, 002377/77

Int. Cl.³ B65H *81/00*

U.S. Cl. 156—161 **10 Claims**



1. Method for the production of an elongated hollow body comprising the steps of:

providing a pair of spaced gripping members with an area between them,

attaching longitudinally under tension a plurality of filaments or bands between the gripping members without support in the area between the gripping members in order to form an elongated hollow winding core as a lost core part of the final hollow body to be produced,

applying tension to the filament or bands along their lengths via tensioning means disposed completely outside the area between the gripping members,

winding a filamentous or band type wrapping material around and along the length of said filaments or bands forming said hollow core under controlled tension so as to deflect the filaments or bands of the hollow core inwardly to produce a closed body having a generally hyperboloid shape,

solidifying the hollow body in its hyperboloid shape,

releasing the gripping members, and

removing the completed hollow body from the gripping members without disassembling the gripping members and tensioning means.

4,350,550

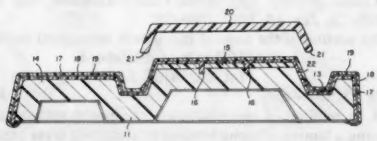
METHOD OF DECORATING CONTRASTING REGIONS OF A MOLDED RESIN PANEL

Dick T. Van Manen, Canandaigua, N.Y., assignor to Voplex Corporation, Pittsford, N.Y.

Division of Ser. No. 150,283, May 16, 1980, abandoned. This application May 4, 1981, Ser. No. 259,991

Int. Cl.³ B05D *5/00*; B32B *31/04*; B44C *1/24*

U.S. Cl. 156—237 **2 Claims**

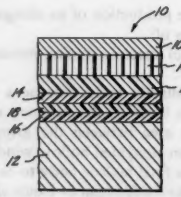


1. A method of decorating contrasting regions of the front surface of a molded resin panel with a decorative material in one region of said front surface and a decorative coating in another region of said front surface, said decorative coating

having a resin undercoating and a clear resin top coating, and said method comprising:

a. securing said decorative material to said one region to form a surface decoration differing from the appearance of said molded resin of said front surface of said panel;
b. masking said decorative material throughout said one region of said front surface;
c. applying said decorative coating to unmasked front surface regions of said panel outside said one region bearing said decorative material, so said decorative coating covers said other region of said front surface of said panel;
d. unmasking said decorative material; and
e. forming said top coating to extend over all of said front surface of said panel to cover both said decorative coating and said decorative material.

4,350,551
FLUID SLIP SHEET AND METHOD
Gary L. Michaelson, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Dec. 29, 1980, Ser. No. 221,321
Int. Cl.³ B29C *19/00*
U.S. Cl. 156—245 **6 Claims**



1. A method for curing a part and allowing it to conform to the contoured surface of a mold, said mold and said part having dissimilar coefficients of expansion, comprising:

interposing a sheet of flexible material that is a solid at room temperature and a liquid at an elevated curing temperature between said part and said mold,

heating said sheet, said mold, and said part to an elevated curing temperature, and

allowing said part and said mold to move relative to one another as they differentially expand.

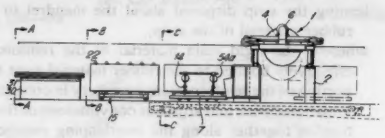
4,350,552
METHOD AND APPARATUS FOR CUTTING STONE PANELS
Patrick T. Bourke, Doon House, Maam, County Galway, Ireland
Continuation-in-part of Ser. No. 64,999, Aug. 7, 1979, which is a division of Ser. No. 848,352, Nov. 3, 1977, abandoned, which is a continuation-in-part of Ser. No. 868,213, May 12, 1976, Pat. No. 4,063,982, which is a continuation-in-part of Ser. No. 394,138, Sep. 4, 1973, Pat. No. 3,963,846. This application May 8, 1980, Ser. No. 147,757
Claims priority, application United Kingdom, Sep. 4, 1972, 40839/72; Jan. 19, 1973, 2795/73
The portion of the term of this patent subsequent to Dec. 20, 1994, has been disclaimed.
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—254 **3 Claims**

1. A method of manufacturing composite surface elements having a lamina of stone bonded to a backing layer comprising the steps of:

(i) applying and bonding to each of the two opposed faces of a stone slab a backing layer comprising a core of lightweight material which is resistant to compressive forces in a direction substantially normal to the plane of the layer;

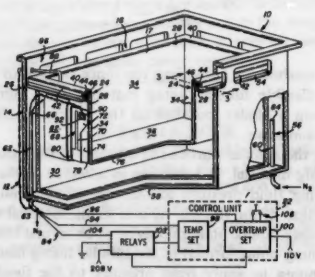
(ii) gripping the slab, with backing layers attached, by means of a slab-gripping device;

(iii) presenting one longitudinal edge of the slab to a disc saw and sawing the slab along a cutting plane substantially parallel to and midway between the aforesaid opposed faces of the slab to a depth which is approximately half the depth of the slab; and



(iv) presenting the opposite longitudinal edge of the slab to a disc saw, gripping the slab as in step (ii), and sawing along the same cutting plane as in step (iii) through the remainder of the depth of the slab thereby sawing the slab in two to leave a thin stone lamina adhered to each of the backing layers.

4,350,553
ACID BATH APPARATUS
Paul V. Mendes, 941 Tamarack, Sunnyvale, Calif. 94086
Filed Jul. 27, 1981, Ser. No. 287,424
Int. Cl.³ C23F *1/02*
U.S. Cl. 156—345 **9 Claims**



1. An acid bath apparatus comprising, in combination:

(a) housing means forming a first container having an open top, the opening being rectangular in configuration and defined by the inside edges of a circumscribing upwardly facing surface;

(b) resilient seal means disposed upon said upwardly facing surface; and

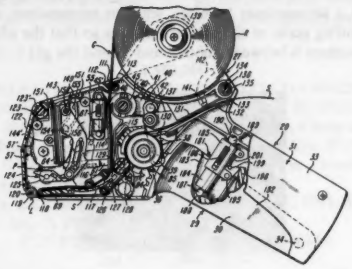
(c) beaker means forming a rectangular second container having a rectangularly configured open top, the opening being defined by an outwardly and downwardly turned lip, said beaker means being disposed within said first container with said lip extending over said surface and engaging said seal means, said beaker means being supported by said seal means and said surface, said seal means forming an airtight seal at the top of a chamber defined by the inside surface of said housing means and the outside surface of said beaker means.

4,350,554

LABEL PRINTING AND APPLYING APPARATUS

Robert M. Pabodie, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 110,720, Jan. 9, 1980, Pat. No. 4,290,839.
This application Jun. 25, 1981, Ser. No. 277,420
Int. Cl.[3] B65C *11/02*
U.S. Cl. 156—384 5 Claims



1. Hand-held apparatus for printing and applying pressure sensitive labels releasably carried on a web of supporting material including a frame having a handle, an actuator disposed at the handle and movable between an initial position and an actuated position, means for printing on the labels, the printing means having an initial position and an actuated position, means for delaminating printed labels, means for applying printed labels, means engageable with the web to advance the web to effect label delamination at the delaminating means, moving means coupled to the actuator, to the printing means and to the web advancing means for printing on a label and thereafter advancing the printed label to the applying means, and return spring means for returning the printing means and the actuator to their initial positions and for operating the moving means to move the web advancing means, the improvement comprising an easy-to-handle subassembly including a pair of telescoping members having an internal opening, a compression spring captive in the opening for urging the members apart, means for preventing separational movement of the members and release of the spring, means coupled to the telescoping members for preventing return of the actuator to its initial position until the actuator has been moved from its initial position into its actuated position, wherein the return preventing means of the subassembly includes a ratchet on one telescoping member and a pawl mounted on the other telescoping member, the pawl having a ratcheting position in which the pawl cooperates with the ratchet and a reset position in which the pawl is out of contact with the ratchet, an overcenter mechanism including a spring for moving the pawl between its ratcheting and reset positions and for holding the pawl in either its ratcheting position or its reset position, and reset means carried by the one telescoping member for resetting the pawl to its reset position.

4,350,555

PRECISION LAMINATING PRESS

Andrew Popoff, Mountain Lakes, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Jul. 10, 1980, Ser. No. 168,235
Int. Cl.[3] B32B *31/00;* B44C *1/00;* B65H *25/00;* B41D *7/00*
U.S. Cl. 156—540 9 Claims

1. A laminating press comprising:

(a) a frame;

(b) a first roller supported for rotation upon a first axle journaled in bearing means mounted on said frame;

(c) a second roller supported for rotation upon a second axle disposed substantially parallel to said first axle and journaled in bearing means mounted on said frame;

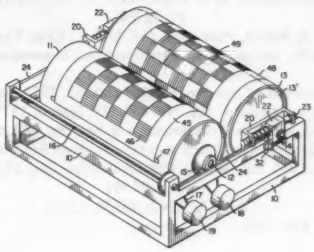
(d) at least one of said first and second bearing means being mounted on said frame for reciprocal movement transverse to the axle of its supported roller and in the plane coincident with the axes of both said rollers to thereby effect relative movement of said rollers into and out of surface contact;

(e) first drive means for imparting said reciprocal movement

(1) in one direction to effect and maintain said rollers in surface contact, and

(2) in an opposite direction to effect separation of said rollers,

(f) first drive control means for establishing the direction of said reciprocal movement;



(g) alignment means associated with each of said rollers arranged to retain said rollers in precise circumferential alignment prior to the time their respective surfaces come into contact;

(h) registration means associated with at least one of said first and second rollers for temporarily locating a flexible sheet in a precise position on the surface thereof;

(i) holding means associated with the other of said rollers for maintaining a flexible sheet in a fixed position on the surface thereof;

(j) second drive means for imparting rotational movement to at least one of said rollers; and

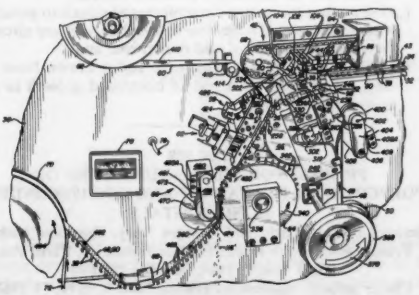
(k) second drive control means for controlling the operation of said second drive means.

4,350,556

COMPONENT RETAPING MACHINE WITH TOOTH ENGAGING MEANS

John Hofbauer, Des Plaines, Ill., assignor to Die-Craft Metal Products, Inc., Des Plaines, Ill.

Filed Sep. 19, 1980, Ser. No. 188,967
Int. Cl.[3] B65B *15/04;* B65H *5/26*
U.S. Cl. 156—541 17 Claims



1. Apparatus for removing components from a carrier strip, comprising:

means for receiving an input carrier strip having at least one radial lead component releaseably secured thereto, said

component including a head and at least one lead extending from said component head, said component head and said lead extending from said input carrier strip;

puller tool means including tooth means;

transport means for engaging said tooth means against some surface of said component which faces toward said input carrier strip, and transporting said puller tool means in a direction to pull said component free of said input carrier strip whereby removal is accomplished without pinching said component.

4,350,557

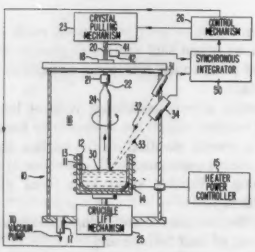
METHOD FOR CIRCUMFERENTIAL DIMENSION MEASURING AND CONTROL IN CRYSTAL ROD PULLING

Richard A. Scholl, Palo Alto, and John L. Cole, Fremont, both of Calif., assignors to Ferrofluidics Corporation, Nashua, N.H.

Continuation of Ser. No. 85,089, Oct. 15, 1979, abandoned, which is a division of Ser. No. 857,331, Dec. 5, 1977, Pat. No. 4,207,293, which is a continuation of Ser. No. 682,293, May 3, 1976, abandoned, which is a continuation of Ser. No. 479,316, Jun. 14, 1974, abandoned. This application Apr. 27, 1981, Ser. No. 257,591

Int. Cl.³ C30B *15/26, 15/30*

U.S. Cl. 156—601 **18 Claims**



1. A method for controlling the growth of a crystal rod in a direction transverse to the axis of said rod, as said rod is being drawn from a melt in a substantially vertical direction, which method comprises:

(a) providing relative rotation of said rod with respect to the melt, while drawing the crystal rod from the melt;

(b) sensing electromagnetic radiation from the circumference of the meniscus, which occurs at the interface between said rod and said melt, and obtaining a signal responsive to a substantial circumferential dimension of said crystal rod, for successive rotations thereof;

(c) integrating successive circumferential signals to generate a correction signal indicative of the change of any circumferential dimensions of said drawn rod; and

(d) adjusting the rate at which the rod is drawn from the melt, to provide for a rod of controlled growth in the transverse direction.

4,350,558

PROCESS FOR THE MANUFACTURE OF POLYCRYSTALLINE GARNET AND CORRESPONDING MONOCRYSTALS

Bernard Boudot, Paris, and Georges Nury, Frepillon, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 7, 1980, Ser. No. 204,894

Claims priority, application France, Nov. 9, 1979, 79 27658

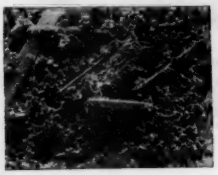
Int. Cl.³ C30B *15/00*

U.S. Cl. 156—617 SP **20 Claims**

1. A process for manufacturing a pure polycrystalline garnet consisting essentially of aluminium and/or gallium and/or indium, oxygen and at least one element taken from the group consisting of the rare earths and yttrium, which process comprises the following steps:

(1) a solution is prepared consisting essentially of the salts of the constituent cations of the garnet, in the proportions corresponding to the composition of the desired garnet structure;

(2) the corresponding hydroxides are co-precipitated by means of a base in order to obtain a co-hydroxide, the solution of salts and the base being added simultaneously at a temperature between ambient temperature and the boiling point of the solution of salts so that the pH of the medium is between about 5 and 10 and the pH is kept at a



constant value, within these limits, throughout the co-precipitation, said constant pH value being that at which no aluminum hydroxide and/or gallium hydroxide and/or indium hydroxide is redissolved, and at which the precipitation of the rare earth hydroxides and yttrium hydroxide is complete;

(3) the co-hydroxide is filtered off;

(4) the co-hydroxide is washed;

(5) the co-hydroxide is dried; and

(6) the co-hydroxide is then subjected to a single calcination at a temperature between about 800° C. and 1500° C. until completely reacted, whereby said pure polycrystalline garnet is produced.

4,350,559

PROCESS FOR THE MANUFACTURE OF POLYCRYSTALLINE GARNET AND CORRESPONDING MONOCRYSTAL

Bernard Boudot, Paris, and Georges Nury, Frepillon, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 7, 1980, Ser. No. 204,896

Claims priority, application France, Nov. 9, 1979, 79 27657

Int. Cl.³ C30B *15/00*

U.S. Cl. 156—617 SP **17 Claims**

1. A process for manufacturing a pure polycrystalline garnet, which process consists essentially of the following steps:

(1) a solution consisting essentially of the salts of the constituent cations of the garnet is prepared in accordance with the process comprising the following steps:

(a) the oxides of the constituent cations of the garnet are calcined;

(b) the amounts of oxides fixed by the formula of the garnet are weighed;

(c) each oxide is dissolved in an acid; and

(d) the resulting solutions of salts are mixed;

(2) the corresponding hydroxides are co-precipitated by

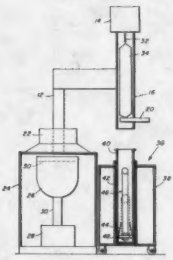
addition of a base to the solution in order to obtain a co-hydroxide;
(3) the co-hydroxide is filtered off;
(4) the co-hydroxide is washed;
(5) the co-hydroxide is dried; and
(6) the co-hydroxide is then subjected to a single calcination at a temperature of between about 800° C. and 1500° C. until completely reacted, whereby said pure polycrystalline garnet is produced, said garnet consisting essentially of the constituent cations from the solution and oxygen.

4,350,560

APPARATUS FOR AND METHOD OF HANDLING CRYSTALS FROM CRYSTAL-GROWING FURNACES

Walter Helgeland, Lexington; Alex Teverovsky, Concord, both of Mass.; Kenneth H. Kerwin, II, Londonderry, N.H., and Carl P. Chartier, Danvers, Mass., assignors to Ferrofluidics Corporation, Nashua, N.H.

PCT No. PCT/US81/00668, § 371 Date Aug. 7, 1981, § 102(e) Date Aug. 7, 1981
PCT Filed May 19, 1981, Ser. No. 298,242
Int. Cl.³ C30B *15/32*
U.S. Cl. 156—617 SP **17 Claims**



8. A method of handling a grown crystal from a Czochralski crystal-growing furnace, which method comprises:
(a) drawing a seeded crystal from a melt in a crucible in a lower melt chamber, having a contaminant-free atmosphere, into an upper crystal-receiving chamber;
(b) supporting the grown crystal in the upper chamber;
(c) sealing the lower melt chamber from the upper chamber;
(d) opening the upper chamber to the atmosphere;
(e) transferring the upper crystal chamber with the supported crystal to a crystal-discharging position free of the lower melt chamber;
(f) positioning a separate, lower, crystal-receiving chamber in a position to receive the supported crystal from the upper crystal chamber;
(g) lowering the crystal from the upper crystal chamber into the lower crystal chamber; and
(h) transporting the grown crystal in the lower crystal chamber to a new location.

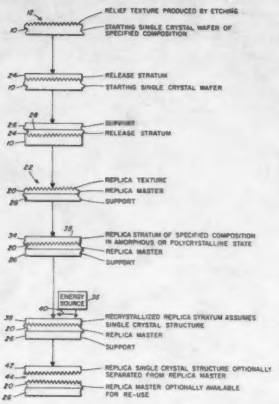
4,350,561

SINGLE CRYSTAL PROCESSES AND PRODUCTS

Roger G. Little, Bedford, Mass., assignor to Spire Corporation, Bedford, Mass.

Filed May 16, 1980, Ser. No. 150,331
Int. Cl.³ B01J *17/04*
U.S. Cl. 156—624 **7 Claims**

1. A method for forming a single crystal structure which is a replica of a starting single crystal structure comprising:
(a) texture etching a surface of a starting single crystal structure of a specific crystalline orientation;
(b) making a replica master of said texture-etched surface of said starting single crystal structure;
(c) depositing a replica stratum in the amorphous state on said replica master; and
(d) recrystallizing said amorphous replica stratum to form a replica single crystal structure corresponding in crystal-



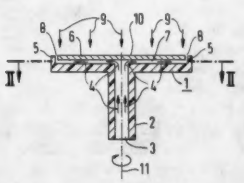
line orientation to said specific crystalline orientation of said starting single crystal structure and with a relief surface analogous to the texture-etched surface of said starting single crystal structure.

4,350,562

METHOD FOR ETCHING SEMICONDUCTOR WAFERS ON ONE SIDE

Bonü Bonü, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 18, 1981, Ser. No. 274,883
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1980, 3027934
Int. Cl.³ H01L *21/306*
U.S. Cl. 156—639 **7 Claims**

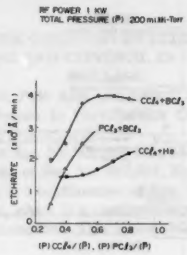


1. Method for etching semiconductor wafers on one side, which comprises suspending a semiconductor wafer to be etched on a rotating gas cushion with the semiconductor wafer surface not to be etched facing the rotating gas cushion while the semiconductor wafer surface to be etched is free, and spraying the free semiconductor surface with etchant, said wafer in contact with the rotating gas cushion rotating and moving the etchant thereon outward away from the center.

4,350,563
DRY ETCHING OF METAL FILM

Tadakazu Takada, Kawasaki; Kazuo Tokitomo, Aizuwakamatsu, and Hitoshi Hoshino, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 31, 1980, Ser. No. 174,140
Claims priority, application Japan, Jul. 31, 1979, 54/98201; Jul. 31, 1979, 54/98202; Jul. 31, 1979, 54/98203
Int. Cl.³ C23F 1/02
U.S. Cl. 156—643 12 Claims

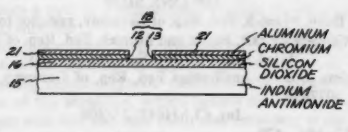


1. A process for dry etching of metal film having aluminum as a main component, comprising the step of exposing said metal film to an etchant gas consisting essentially of carbon chloride and boron chloride.

4,350,564
METHOD OF ETCHING METALLIC MATERIALS INCLUDING A MAJOR PERCENTAGE OF CHROMIUM

Ching-Yeu Wei, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 27, 1980, Ser. No. 200,771
Int. Cl.³ B44C 1/22
U.S. Cl. 156—659.1 16 Claims



1. A method of etching a first pattern in a film of a metal including a major percentage of chromium formed on the surface of a substrate comprising:

depositing a layer of a material which is resistant to the etching action of an acidic etchant over the exposed surface of said film of metal,

forming in said layer of etch-resistant material a second pattern which is substantially identical to said first pattern to expose portions of said film of metal constituting said first pattern,

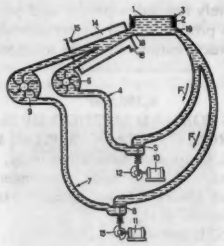
depositing a thin layer of a metal electropositive with respect to chromium on the portions of said film of metal exposed by said second pattern, said layer being provided with a multiplicity of holes extending between major surfaces thereof,

etching the portions of said layer of metal deposited in the portions of said layer of etch-resistant material exposed by said second pattern and the portions of said film of metal lying thereunder with said acidic etchant to remove the portions of said film of metal contained within said first pattern and the portions of said layer of metal lying thereover.

4,350,565
PROCESS FOR CONCENTRATING FLUIDS

Rene J. Bocognano, 3, square d'Amiens, Paris, France

Filed Jun. 25, 1980, Ser. No. 162,850
Claims priority, application France, Jun. 26, 1979, 79 16469
Int. Cl.³ B01D 1/30, 3/10
U.S. Cl. 159—47 R 13 Claims



1. A process for concentrating fluids by effecting vibration of an element at a predetermined frequency, comprising the steps of:

providing at least one resiliently-mounted element across an opening in a hollow housing;

circulating a circulation fluid through said housing such that it comes into direct contact with, and at least partially supports, said at least one element;

feeding the fluid to be concentrated onto said resiliently-mounted element; and

generating periodic vibrations in said fluid by at least partially obstructing the circulation of said circulation fluid so as to produce a water hammering effect sufficient to cause vibration of said element at a predetermined frequency so as to divide said liquid to be concentrated into fine droplets such that the evaporation surface thereof is substantially increased.

4,350,566
PROCESS FOR THE DELIGNIFICATION OF LIGNOCELLULOSE MATERIALS WITH DINITROANTHRAQUINONES

Heinz U. Blank, Odenthal; Günther Klag, Leverkusen, and Peter Schnegg, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 158,022, Jun. 9, 1980, abandoned. This application Apr. 27, 1981, Ser. No. 257,842
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1979, 2925544
Int. Cl.³ D21C 3/02
U.S. Cl. 162—72 4 Claims

1. In the delignification of lignocellulose material by digestion in a liquid containing an anthraquinone-type compound, the improvement which comprises effecting the delignification in a closed reaction vessel at a maximum temperature in the range from 150° to 200° C. for 0.5 to 480 minutes employing as said anthraquinone-type compound a dinitroanthraquinone in 0.001 to 10% by weight of the lignocellulosic material.

4,350,567
METHOD OF PRODUCING A BUILDING ELEMENT

David R. Moorehead, and Michael Davis, both of Sydney, Australia, assignors to CSR Limited, Sydney, Australia

Continuation of Ser. No. 27,063, Apr. 5, 1979, abandoned. This application Aug. 29, 1980, Ser. No. 182,633
Claims priority, application Australia, Aug. 4, 1978, PD5375
Int. Cl.³ D21H 3/73
U.S. Cl. 162—145 10 Claims

1. A method of manufacturing a cellulose fibre reinforced,

high impact strength carbonate building element which comprises steps of:

(a) mixing solids and water to produce a slurry in which the solids consist essentially of at least one alkali earth oxide or hydroxide and an amount of cellulose fibres in the range 7–40% by weight of solids;

(b) forming the slurry as a gas permeable shape having voids that contain water and so that the shape has a porosity in the range 35 to 50%, where porosity is the volume of the voids within the shape expressed as a percentage of the volume of the whole shape; and

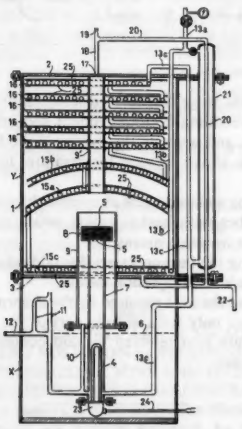
(c) causing carbon dioxide gas to permeate into the shape by means of the voids thereby converting the hydroxide(s) to carbonate(s) and imparting high impact strength to the resulting element, this converting step being performed in a short time period dependent on the percentage carbon dioxide present in the processing atmosphere to produce a building element of high impact strength which is not dependent on the presence of aggregate for its impact strength, said period being about 30 minutes for 100 percent carbon dioxide.

4,350,568

HIGH EFFICIENCY WATER DISTILLATION APPARATUS

Romulo V. Dalupan, No. 1351 Bayswater Cresc., Windsor, Ontario, Canada

Filed Apr. 15, 1981, Ser. No. 254,305
Int. Cl.³ B01D *3/02*
U.S. Cl. 202—180 **3 Claims**



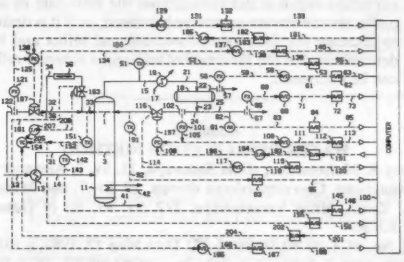
1. A water-distillation apparatus built of non-corrosive materials and comprising, in combination, an enclosed, generally cylindrical container, a divider plate in an intermediate potion of said container dividing said container into an upper chamber and a lower chamber, an upright tube in said lower chamber and communicating with a central portion of said upper chamber, heating means within said upright tube, a perforated container positioned at the top of said upright tube and containing balls for separating boiling water and vaporized water so that the boiling water can be returned to said upright tube, a plurality of coiled tubes in spaced, generally horizontal planes in said upper chamber, means forming a condenser chamber located outside said cylindrical container, a centrally-located tube in said upper chamber extending through said plurality of coils, a first outlet pipe communicating with the upper end of said central tube and extending through said condenser chamber, a second outlet pipe communicating with the lower end of said upper chamber and with said first outlet pipe, a return pipe communicating with the uppermost one of said coiled tubes and with the lower end of said upright tube for supplying heated water from said coiled tubes to said upright tube, a supply water pipe for supplying water to be distilled to said condenser chamber around said first outlet pipe and for supplying water to be distilled to the lowermost one of said coiled tubes in said upper chamber, whereby water is supplied to said upright tube through said condenser chamber and through said coiled tubes.

4,350,569

FRACTIONAL DISTILLATION COLUMN CONTROL

Danny L. Furr, Broken Arrow, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 165,463, Jul. 2, 1980, Pat. No. 4,295,196.
This application May 20, 1981, Ser. No. 265,476
Int. Cl.³ B10D *3/42*
U.S. Cl. 203—2 **3 Claims**



1. A method for maintaining a desired internal reflux flow rate in an upper portion of a fractional distillation column, wherein a feed stream to said fractional distillation column is preheated by a pump around stream which is withdrawn from a first upper portion of said fractional distillation column and returned to a second upper portion of said fractional distillation column which is above said first upper portion of said fractional distillation column and wherein an overhead vapor stream is withdrawn from an upper portion of said fractional distillation column, cooled, and separated into a liquid phase and a vapor phase, with a first portion of said liquid phase being returned to a third upper portion of said fractional distillation column as an upper external reflux which is above said first upper portion and a second portion of said liquid phase being withdrawn as a product stream, said method comprising the steps of:

using computing means to calculate and establish a first signal representative of the actual flow rate of the internal reflux in an upper portion of said fractional distillation column;

using computing means to calculate and establish a second signal representative of the flow rate of the internal reflux in the upper portion of said fractional distillation column required to maintain a desired product specification for said product stream;

comparing said first signal and said second signal to thereby determine if the internal reflux flow rate in the upper portion of said fractional distillation column should be increased or decreased;

determining if the flow rate of said pump around stream can be increased;

determining if the flow rate of said upper external reflux can be decreased;

using computing means to calculate and establish a third signal representative of the flow rate of said pump around stream required to make said first signal substantially equal to said second signal;

establishing a fourth signal representative of the highest desired flow rate of said pump around stream;

using computing means to calculate and establish a fifth

signal representative of the flow rate of said upper external reflux required to make said first signal substantially equal to said second signal;

establishing a sixth signal representative of the lowest desired flow rate of said upper external reflux;

manipulating the flow rate of said pump around stream in response to said third signal and manipulating the flow rate of said upper external reflux in response to said sixth signal if it is desired to increase the flow rate of said internal reflux and it is determined that the flow rate of said pump around stream can be increased or if it is desired to decrease the flow rate of said internal reflux and it is determined that the flow rate of said upper external reflux cannot be decreased; and

manipulating the flow rate of said pump around stream in response to said fourth signal and manipulating the flow rate of said upper external reflux in response to said fifth signal if it is desired to increase the flow rate of said internal reflux and it is determined that the flow rate of said pump around stream cannot be increased, or if it is desired to decrease the flow rate of said internal reflux and it is determined that the flow rate of said upper external reflux can be decreased.

4,350,570

WATER DESALINATION METHOD

Valery S. Maisotsenko, ulitsa Sadovaya, 21, kv. 7; Alexandr B. Tsimerman, Chernomorskaya doroga, 19, kv. 7, and Mikhail G. Zexer, ulitsa Varnenskaya, 2/2, kv. 91, all of Odessa, U.S.S.R.

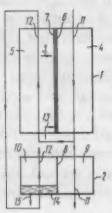
PCT No. PCT/SU80/00069, § 371 Date May 17, 1981, § 102(e) Date May 8, 1981, PCT Pub. No. WO81/00707, PCT Pub. Date Mar. 19, 1981

PCT Filed May 5, 1980, Ser. No. 261,200

Claims priority, application U.S.S.R., Sep. 17, 1979, 2817564

Int. Cl.³ C02F *1/10*

U.S. Cl. 203—10 **4 Claims**



1. A method for desalinating water from an aqueous salt solution comprising

(a) passing a primary air stream through a cooling zone of an evaporation unit;

(b) withdrawing about 20 to 90 volume percent of the cooled primary air stream from the outlet of said evaporation unit cooling zone and passing it as a secondary air stream through an evaporation zone of said evaporation unit wherein said secondary air stream becomes humidified with moisture evaporating from an aqueous salt solution contained therein, said humidification being accomplished by virtue of the psychrometric temperature difference between the primary air stream and the secondary air stream as they pass in indirect heat exchange through the cooling zone and evaporation zone, respectively, thereby increasing the moisture content in the secondary air stream from about 3.5 to 116 g/kg;

(c) passing the remaining 10 to 80 volume percent of the cooled primary air stream through a cooling zone of a condensing unit;

(d) passing the humidified secondary air stream from the outlet of said evaporation zone to a condensing zone of the condensing unit wherein moisture is condensed therefrom in the form of desalinated water, as a result of indirect heat exchange between the secondary air stream in the condensing zone and the cooled primary air stream in the cooling zone.

4,350,571

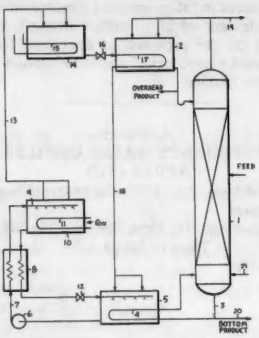
ABSORPTION HEAT PUMP AUGMENTED THERMAL SEPARATION PROCESS

Donald C. Erickson, 1704 S. Harbor La., Annapolis, Md. 21401

Filed Oct. 10, 1980, Ser. No. 195,842

Int. Cl.³ E01D *3/14*

U.S. Cl. 203—21 **5 Claims**



1. In a plural stage fractional distillation process including the steps of reboiling bottom product and condensing overhead product, and wherein the overhead product condensing temperature is above ambient temperature, the improvement comprising:

(a) providing a closed cycle absorption heat pump including an absorber with heat rejection means and a condenser with heat rejection means;

(b) supplying the heat necessary for said reboiling step from both of said heat rejection means;

(c) supplying the heat required by the absorption heat pump evaporator only from at least part of the above ambient temperature heat rejected by said condensing overhead product step.

4,350,572

PURIFICATION OF CARBOXYLIC ACID ESTERS CONTAINING ALDEHYDES AND/OR ACETALS

Rudolf Kummer, Frankenthal; Volker Taglieber, Ludwigshafen; Franz-Josef Weis, Weinheim, and Heinz-Walter Schneider, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 6, 1980, Ser. No. 204,637

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1979, 2949073

Int. Cl.³ B01D *3/34*

U.S. Cl. 203—35 **7 Claims**

1. A process for purifying carboxylic acid esters which have been obtained by carbonylizing olefinically unsaturated compounds with carbon monoxide and alkanols and which contain color formers including aldehydes or acetals, wherein the said esters are contacted with strongly acidic agents of preselected kind and concentration sufficient to reduce said color formers sufficiently to provide a polymer grade ester product, with or without addition of water.

4,350,573

HALOGENATED AROMATIC AMINES WHICH ARE STABLE IN COLOR, AND A PROCESS FOR THEIR PREPARATION

Helmuth Kritzler, Odenthal; Walter Böhm; Ulrich Kappler, both of Leverkusen, all of Fed. Rep. of Germany, and Hans D. Winkelmann, Charleston, S.C., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 27, 1980, Ser. No. 200,843

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1979, 2945868

Int. Cl.³ B01D *3/14*

U.S. Cl. 203—86 14 Claims

1. A halogenated aromatic amine which is stable in color, said halogenated aromatic amine obtained by a process wherein an aromatic amine is recovered by distillation, the distillation being carried out in equipment made of a rustproof material.

4,350,574

METHOD FOR DEPOSITING AN OXIDE COATING

Glen E. McDonald, Strongsville, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 23, 1981, Ser. No. 246,772

Int. Cl.³ C25B *1/02*

U.S. Cl. 204—56 R 4 Claims

1. In a method of coating a substrate with a black metal oxide film from an electroplating solution containing about 44 ounces per gallon (a salt of a metal selected from the group consisting essentially) of cobalt sulfate, about 6 ounces per gallon of cobalt chloride, and about 5 ounces per gallon of boric acid having PH in the range between about 1.0 and about 6.0 at a temperature of about 115° F. (, nickel, chromium, and manganese) to form a solar collector that is highly absorbing, the improvement comprising

adding an oxidizing agent to said plating solution,

mounting said substrate in said solution to form a cathode, and

electrodepositing cobalt (said metal) from said solution onto said substrate at said cathode by passing a current of about 40 amps per square foot of substrate therethrough while simultaneously oxidizing the same.

4,350,575

METHOD FOR PREPARING AN AQUEOUS TREATMENT SOLUTION CONTAINING AT LEAST HYDROGEN PEROXIDE IONS AND HYDROXYL IONS IN PREDETERMINED CONCENTRATIONS

Augusto Porta, Geneva, Switzerland; Jean-Marie Fresnel, Haut-Thoiry, France, and Antonin Kulhanek, Le Lignon, Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

PCT No. PCT/CH78/00044, § 371 Date Aug. 6, 1979, § 102(e) Date Jul. 23, 1979, PCT Pub. No. WO79/00347, PCT Pub. Date Jun. 28, 1979

PCT Filed Dec. 4, 1978, Ser. No. 130,167

Claims priority, application Switzerland, Dec. 6, 1977, 14876/77

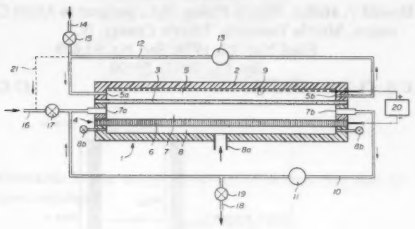
Int. Cl.³ C25B *1/30*

U.S. Cl. 204—84 1 Claim

1. An electrolytic oxidation and reduction method for preparing an aqueous treatment solution comprising hydrogen peroxide and hydroxyl ions in predetermined concentrations variable within a concentration range such that said treatment solution has a total hydrogen peroxide concentration of 0.1 to 10 g of H_2O_2/liter of solution and a predetermined pH of less than 14, which comprises the steps of:

(a) applying an electric current across at least one flat, horizontal electrolytic cell comprising a horizontal anode in contact with an anolyte in a flat, horizontal anolyte compartment and a porous, horizontal cathode in contact with a catholyte in a flat, horizontal catholyte compartment, said anode and said cathode being separated from one another by a horizontal cationic exchange membrane or a horizontal semipermeable microporous diaphragm, said catholyte being constituted by an aqueous alkaline solution of an initial pH of 7 to 12 which is lower than the predetermined pH value of the treatment solution to be prepared, and wherein said anolyte compartment is located above said catholyte compartment;

(b) circulating in contact with said porous cathode during application of said electric current, said catholyte, while feeding an oxygen-containing compressed gas through



said cathode into said catholyte compartment to form hydrogen peroxide ions and hydroxyl ions at said cathode by electrolytic reduction of the oxygen;

(c) continuing said catholyte circulation in contact with said porous cathode, without otherwise altering its chemical composition until said catholyte attains said predetermined concentration of hydrogen peroxide ions and hydroxyl ions to form an aqueous treatment solution;

(d) following step (c), terminating said circulation and cutting off said electric current; and

(e) discharging the electrolyte as said aqueous treatment solution with a weight ratio of hydrogen peroxide to sodium hydroxide between 0.4 and 4.

4,350,576

METHOD OF PRODUCING A GRAPHITE INTERCALATION COMPOUND

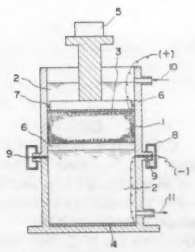
Nobuatsu Watanabe, Nagaokakyo; Teruhisa Kondo, Toyonaka, and Jiro Ishiguro, Suita, all of Japan, assignors to Toyo Tanso Co., Ltd., Osaka, Japan

Filed Dec. 12, 1980, Ser. No. 215,846

Claims priority, application Japan, Dec. 14, 1979, 54-161439

Int. Cl.³ C25B *1/00, 1/22*

U.S. Cl. 204—101 6 Claims



1. A method of producing a graphite intercalation compound in an electrolytic cell having a cathode, an anode and an anode chamber adapted to accommodate graphite particles therein, which comprises electrolyzing graphite particles in the anode chamber in an aqueous electrolytic solution con-

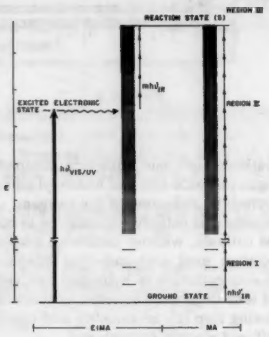
taining a substance capable of intruding into the interlayer spacings of graphite, thereby intercalating said substance into the interlayer spacings of graphite, wherein the electrolyzing is carried out at a current density of less than 500 mA^2/cm^2 and while applying a pressure to the graphite particles accommodated in the anode chamber in at least one direction so as to press the graphite particles against the surface of the anode.

4,350,577

ELECTRONICALLY INDUCED MULTIPHOTON ABSORPTION

Donald F. Heller, Morris Plains, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 13, 1979, Ser. No. 93,659
Int. Cl.³ B01D *59/00*
U.S. Cl. 204—157.1 R **17 Claims**



1. A multiphoton excitation method comprising the sequential steps of:

(a) exposing a material comprising polyatomic molecules to electromagnetic radiation of a predetermined wavelength in the range from visible to ultraviolet whereby the polyatomic molecules are excited to an excited electronic state having a nonradiative lifetime for decay to an excited vibrational state of a lower electronic state and

(b) exposing the material to infrared laser radiation, whereby the excited molecules that have decayed to the excited vibrational state of the lower electronic state are excited by multiphoton absorption to higher vibrational states to produce a state at which the excited molecules undergo a chemical reaction.

4,350,578

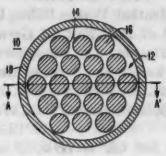
CATHODE FOR ETCHING

Rudolf G. Frieser, Poughkeepsie; William H. Ma; Gunars M. Ozols, both of Wappingers Falls, and Bryant N. Zingerman, Monroe, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 11, 1981, Ser. No. 262,020
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 R **6 Claims**

1. In a process for reactive ion etching workpieces that are supported in a plurality of recesses formed in one face of a quartz plate cathode, the improvement comprising:

1. placing disks made of the same material as the workpiece to be etched in each of said recesses so that the disks are below the level of said face and larger than the workpiece, and



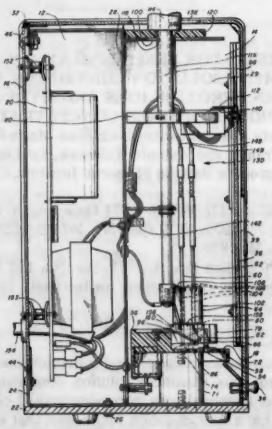
2. placing a border of the same material as the workpiece around the outer edge of the quartz plate cathode.

4,350,579

TESTING APPARATUS FOR MEASURING IONS IN FLUIDS

Henry D. Schwartz, Palo Alto; Irwin H. Krull, Santa Clara; Carl J. Clement, Los Altos Hills; Frederick H. Stengel, Palo Alto, and David D. Hayslett, San Jose, all of Calif., assignors to Applied Medical Technology, Inc., Mountain View, Calif.

Filed Sep. 4, 1980, Ser. No. 183,983
Int. Cl.³ G01N *27/28*
U.S. Cl. 204—195 R **35 Claims**



27. A portable testing apparatus for use in the measurement of ions in fluids,

said apparatus having an enclosing casing,

said enclosing casing including an area closed to the atmosphere by door means,

a hand operable vertical and horizontally movable electrode holder,

oscillating means operatively arranged with respect to said electrode holder and having a plurality of spaced positions for mounting of sample chambers through access provided by said door means,

said electrode holder acting to provide positioning of an electrode in any one of a plurality of sample chambers positioned on said oscillating means,

said sample chambers being removable and cooperating with a detent means for maintaining said sample chambers in operative position with respect to said electrode holder.

4,350,580

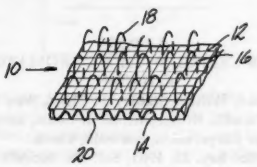
CURRENT DISTRIBUTORS FOR RETICULATE ELECTRODES

Igor V. Kadija, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 143,970, Apr. 25, 1980. This application May 5, 1980, Ser. No. 146,558

Int. Cl.³ C25B *9/04, 11/03, 11/04;* **H01B** *5/08*

U.S. Cl. 204—279 **9 Claims**



1. In a method for distributing electric current to a foraminous electrode used in an electrolytic cell for the electrolysis of aqueous solutions of ionic compounds the improvement which comprises employing as a current distributor:

an electrically conductive fabric having a front side comprised of a plurality of electrode-engaging means selected from the group consisting of hooks or barbs projecting from said front side for attachment to said foraminous electrode and a substantially planar back side suitable for attachment to an electrical conductor, said plurality of electrode-engaging means being at least 2 per square centimeter.

4,350,581

ELECTRODIALYSIS-CELL ASSEMBLY

Harm Schmoldt, Hamburg; Klaus Kock, and Heinrich Strathmann, both of Tubingen, all of Fed. Rep. of Germany, assignors to Forschungsinstitut Berghof GmbH, Tobingen, Fed. Rep. of Germany

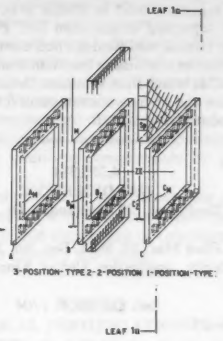
Filed Oct. 20, 1980, Ser. No. 198,368

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1979, 2946284

Int. Cl.³ B01D *13/02*

U.S. Cl. 204—301 **7 Claims**

1. In an electrodialysis apparatus of the type comprising a series of cells formed of membranes and frame members which are bonded together to form a consolidated apparatus, the improvement wherein said frame members form chambers of substantially identical dimensions and wherein said adjacent frame members comprise flow-distribution conduit formed



along substantially the entire perimeter of at least one side of said frame member.

4,350,582

TWO-STAGE COAL LIQUEFACTION PROCESS WITH PROCESS-DERIVED SOLVENT

Joel W. Rosenthal, El Cerrito; Arthur J. Dahlberg, Rodeo, and Christopher W. Kuehler, Larkspur, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 86,186, Oct. 18, 1979, Pat. No. 4,264,429. This application Sep. 10, 1980, Ser. No. 183,112

The portion of the term of this patent subsequent to Mar. 10, 1998, has been disclaimed.

Int. Cl.³ C10G *1/06*

U.S. Cl. 208—8 LE **33 Claims**

1. A process for liquefying coal which comprises:

forming a coal-solvent slurry by mixing subdivided coal with a solvent;

passing said slurry with added hydrogen through a dissolving zone to substantially dissolve said coal;

contacting at least a portion of the effluent from said dissolving zone in a reaction zone containing hydrocracking catalyst under hydrocracking conditions, to produce a second effluent containing heptane-insolubles;

mixing an antisolvent with at least a portion of said second effluent containing heptane-insolubles to produce a substantially heptane-insoluble-free hydrocarbon liquid; and

recycling said substantially heptane-insoluble-free hydrocarbon liquid for use as coal-solvent.

4,350,583

ISOBARIC PROCESS FOR SEPARATING NORMAL PARAFFINS FROM HYDROCARBON MIXTURES

Andrija Fuderer, Antwerp, Belgium, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1980, Ser. No. 189,352

Int. Cl.³ C10G *25/03*

U.S. Cl. 208—310 Z **7 Claims**

1. In an isobaric process for separating normal paraffins from non-normal hydrocarbons in a gas oil-containing vapor feed stream by (1) the selective adsorption of normal paraffins by passage of said feed stream through a molecular sieve adsorbent bed, (2) cocurrent purge with n-hexane to sweep out void space vapor containing a high concentration of non-normal hydrocarbons from the effluent end of the bed, (3) countercurrent purge with n-hexane to desorb normal paraffin adsorbate from the bed, (4) recovery of n-hexane from said separated normal paraffins and non-normal hydrocarbons, and (5) recycling of said n-hexane for purging and desorbing of said bed and to dilute the gas oil-containing feed stream for adsorption

at less than 700° F., the improvement comprising diluting said gas oil-containing feed stream with the final portion of the total countercurrent purge effluent obtained in desorption step (3) as a source of n-hexane used to enable processing of said feed stream to be separated at less than 700° F. without capillary condensation effects, said final portion comprising countercurrent purge effluent containing less than about 6 weight percent normal paraffins other than n-hexane desorbent, whereby the equipment size and energy consumption for processing of said recycle n-hexane are reduced.

4,350,584

GARDEN SIEVE

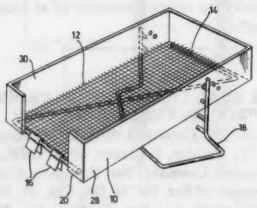
Jerrold H. Donington, 87 Alexandra Dr., Surbiton, Surrey, England

Filed Mar. 10, 1981, Ser. No. 242,408

Claims priority, application United Kingdom, Jun. 2, 1980, 8020523

Int. Cl.³ B07B *1/04*

U.S. Cl. 209—352 **5 Claims**



1. A sieve comprising:

a frame;

a mesh mounted in said frame; and

a stand having at least two equally spaced interconnection means;

said frame having at least two interconnection means spaced along a circumference of a circle and an additional interconnection means disposed at the center of said circle, the radius of said circle equaling the distance between said stand interconnection means, one of said stand interconnection means detachably interconnecting with said additional interconnection means and an adjacent one of said stand interconnection means detachably connecting with one of said frame interconnection means for detachably connecting said stand to said frame in any of a plurality of positions.

4,350,585

DEVICE FOR BLOOD SEPARATION

Anne S. Johansson, Vrakvägen 7A, S-752 52 Uppsala; Claes F. Högman, Statarvägen 14, S-752 45 Uppsala, and Kenneth G. Hedlund, Skiftesvägen 1, S-754 60 Uppsala, all of Sweden

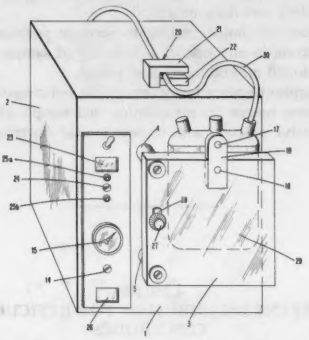
Filed Mar. 25, 1980, Ser. No. 133,867

Claims priority, application Sweden, Mar. 28, 1979, 7902760

Int. Cl.³ B01D *21/26*

U.S. Cl. 210—94 **13 Claims**

1. Apparatus for the separation of whole blood components stratified within a blood bag by essentially uniform compression of said blood bag over the entire bag surface, said apparatus comprising (i) a stationary, rigid planar support surface; (ii) a rigid planar pressure surface fixedly disposed substantially parallel to said support surface (i) and perpendicularly displaceable relative thereto while maintaining said substantially parallel relationship; (iii) means for engagedly positioning and securing a flexible bag of stratified whole blood components comprising at least one outlet conduit between said support surface (i) and said pressure surface (ii); (iv) means for parallely biasing and displacing said pressure surface (ii) towards said support surface (i) along said perpendicular path of displacement and to exert an essentially uniform compressive force upon any blood bag engagedly positioned and secured therebetween, over essentially the entire surface thereof, to squeeze blood component from said at least one outlet conduit; (v)



sensing means for automatically detecting when a pre-selected blood component layer has reached a given level in the blood bag; and (vi) means responsive to said sensing means (v) for automatically terminating the outlet flow of said pre-selected blood component from said blood bag.

4,350,586

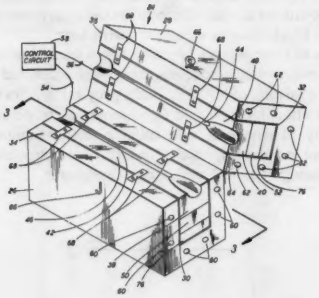
APPARATUS USEFUL WITH A CHROMATOGRAPHY COLUMN

Ralph D. Conlon, Wilton; Stanley F. Miles, New Canaan, and Roland C. Paradis, Bridgeport, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sep. 25, 1981, Ser. No. 305,659

Int. Cl.³ G01N *15/08*

U.S. Cl. 210—149 **13 Claims**



1. Apparatus useful for controlling the temperature of a chromatography column; said apparatus comprising:

a first base member;

first means, associated with said first base member, for receiving said column, said first means being adapted to substantially uniformly accept said column;

a second base member;

second means, associated with said second base member, for receiving said column, said second means being adapted to substantially uniformly accept said column, said first means and said second means being cooperatively formed such that the peripheral surface of said column can be substantially completely contacted thereby; and

means for controlling the temperature of said first and said

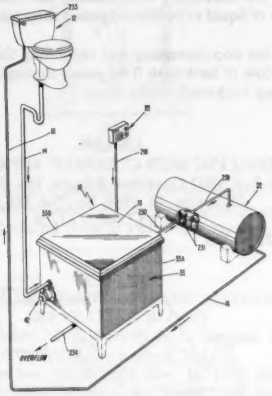
second means whereby said temperature of said column is controlled.

4,350,587

SEWAGE TREATMENT SYSTEM

Donald Jarrell, 4510 Glendale Pl., Nashville, Tenn. 37215, assignor to Donald Jarrell; John G. Logan and Richard H. Carpenter, all of Nashville, Tenn., a part interest

Filed Dec. 5, 1980, Ser. No. 213,665
Int. Cl.³ C02F *3/04*
U.S. Cl. 210—151 **11 Claims**



1. In a sewage treatment apparatus of the type comprising tank means, a grinder submerged in said tank means, means for delivering sewage-containing liquid to said tank means such that solid waste matter is ground into a colloidal mixture by said grinder, sonic nozzles submerged in said tank means, means for delivering oxygen-containing gas to said nozzles which gas is converted by said nozzles into minute oxygen-containing bubbles which permeate the liquid and support the aerobic digestive action of bacteria in the liquid, and means for delivering ozone gas to the treated liquid to disinfect same for delivery to an outlet, the improvement wherein:

said tank means comprises:

a plurality of aerobic pre-treatment compartments interconnected in series for gravity-flow communication, a first of said aerobic pre-treatment compartments having an inlet communicating with said liquid delivery means for receiving sewage-containing liquid and conducting same downstream by gravity flow to a succeeding pre-treatment compartment,

said grinder means communicating with said inlet for grinding all solid waste matter in said liquid and discharging the ground waste and liquid as a colloidal mixture into said first pre-treatment chamber,

some of said sonic nozzles being submerged in said pre-treatment compartments to saturate the latter with minute oxygen-containing bubbles to support aerobic digestive action of bacteria,

an intensive aerobic treatment compartment connected by gravity flow with a final one of said aerobic pre-treatment compartments,

said intensive treatment compartment including an outer wall and containing therein an upright porous member forming a closed loop which is spaced inwardly from said outer wall, said porous member forming circumferentially spaced pockets which are open in a radially outward direction, said porous member supporting the growth of bacteria thereon for consuming waste matter,

said porous member being disposed across the path of travel of the pre-treated liquid toward said oulet, and having its lower end sealed against the passage of liquid therebeneath, so that all of the pre-treated liquid is required to pass through the porous member,

some of said sonic nozzles being disposed in said intensive treatment compartment between said wall and said porous member to saturate said pre-treatment compartment with minute oxygen-containing bubbles, said last-named sonic nozzles having their outlets oriented for establishing a circular flow of liquid in one direction around said porous member,

a disinfecting compartment disposed within the closed loop formed by said porous member and communicating with said intensive treatment compartment by gravity flow, and

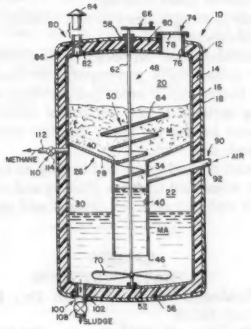
nozzle means submerged in said disinfecting compartment and communicating with a source of ozone gas for saturating the liquid in said disinfecting compartment with ozone gas bubbles to disinfect the liquid.

4,350,588

BIOLOGICAL FERMENTATION DEVICE

Junjiro Tsubota, 2392, Jindaiji-Machi, Chofu-shi, Tokyo 182, Japan

Filed Aug. 14, 1980, Ser. No. 177,878
Int. Cl.³ C02F *11/04*
U.S. Cl. 210—208 **34 Claims**



1. A device for conducting fermentation of materials comprising:

a unitary insulated vessel having an inlet for organic material to be fermented;

a partition mounted in said vessel dividing said vessel into an aerobic fermentation chamber and an anaerobic fermentation chamber, said partition including a conical portion and a downcomer means, said aerobic chamber being in fluid communication with said inlet and said anaerobic chamber, said partition supporting the organic material and being constructed of material capable of transferring heat from said aerobic chamber to said anaerobic chamber in quantities sufficient so that an anaerobic fermentation process conducted in said anaerobic chamber occurs at a desired temperature;

material separating means in said aerobic chamber separating material in said aerobic chamber into high and low molecular weight groups;

air ingesting means fluidly connected to said aerobic chamber;

material transfer means mounted in said vessel to transfer said low molecular weight material from said aerobic chamber to said anaerobic chamber while retaining said high molecular weight material in said aerobic chamber so that anaerobic fermentation occurs with the low molecular weight material;

gas bleed means fluidly connected to said anaerobic chamber;

a gas vent means fluidly connected to said aerobic chamber; and

sludge removal means connected to said anaerobic chamber.

4,350,589

FLOATING JET AERATOR

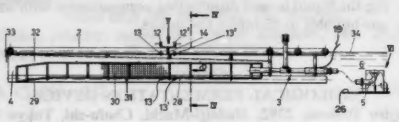
Wilhelm Stog, Waltrop, Fed. Rep. of Germany, assignor to WSW Stahl- und Wasserbau GmbH, Waltrop, Fed. Rep. of Germany

Filed Jul. 9, 1981, Ser. No. 281,644

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1980, 3026519

Int. Cl.³ B01F *3/04*; C02F *7/00*

U.S. Cl. 210—220 **15 Claims**



1. A water-aeration apparatus comprising:

a tubular form defining a substantially closed chamber, said frame being capable of floating and carrying a load when said chamber is filled with air;

means for introducing water into said chamber and for withdrawing air therefrom;

a double-walled conduit supported on said frame and having an outer substantially gas-impervious wall and spaced inwardly therefrom an inner gas-pervious wall, said conduit being inclined to the horizontal when said frame is floating and having an upper conduit end and a lower conduit end; and

a pump carried on said frame and having an air intake above the water when said frame is floating and an air output at said lower end and directed toward said upper end.

4,350,590

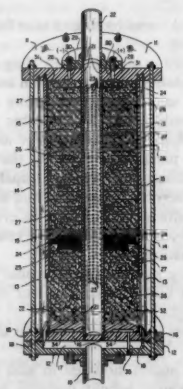
FILTRATION SYSTEM

Norman R. Robinson, 407 E. Edgehill Dr., Davis County, Bountiful, Utah 84010

Filed Feb. 25, 1981, Ser. No. 237,937

Int. Cl.³ B01D *35/06*

U.S. Cl. 210—243 **6 Claims**



1. Filter apparatus capable of removing particles as small as one micron or less from a liquid passing through the filter, said apparatus comprising

a plurality of superimposed layers of fibrous filter media;

a plurality of electrically conductive porous sheets with the electrically conductive porous sheets alternating with the layers of fibrous filter media so that adjacent layers of the superimposed filter media have an electrically conductive porous sheet positioned therebetween;

means for connecting a source of direct current voltage to the electrically conductive porous sheets so that the sheets in the superimposed filter media alternate in polarity;

means for directing a flow of liquid to be filtered through the superimposed filter media;

means for directing a flow of backwash fluid through the superimposed filter media in reverse flow to backwash the filter media;

means for selectively compressing the filter media as the flow of liquid to be filtered passes through the filter media; and

means for decompressing and expanding the filter media as the flow of backwash fluid passes through the filter media during backwash of the filter.

4,350,591

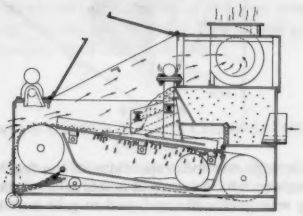
DRILLING MUD CLEANING APPARATUS

Joseph E. Lee, 1802 Crestview, Kilgore, Tex. 75662

Filed Oct. 20, 1980, Ser. No. 198,920

Int. Cl.³ B01D *33/04*

U.S. Cl. 210—384 **5 Claims**



1. Apparatus for separating cuttings from drilling mud, which comprises:

a housing having laterally spaced, upwardly standing sidewalls defining an open area therebetween;

means for directing cutting-laden drilling mud into the open area of the housing;

a traveling belt screen having a planar surface for receiving in an area thereof cutting-laden drilling mud and separating the cuttings therefrom,

the planar screen surface being upwardly inclined in the direction of screen travel, so as to form a puddle of drilling mud over an aft portion of the planar surface;

a mud compaction plate resiliently mounted in the housing opening for vertical movement, the plate extending substantially parallel to the planar screen surface for immersion in the puddle of mud forming thereon; and

a vibrator coupled to the mud compaction plate for imparting vertical vibrational movement to the plate to force penetration of drilling mud through the planar screen surface.

4,350,592

CARTRIDGE FILTER

Dirk G. Kronsbein, Heinrich-Heine Allee 3, 4000 Duesseldorf, Fed. Rep. of Germany

Filed Apr. 10, 1980, Ser. No. 136,085

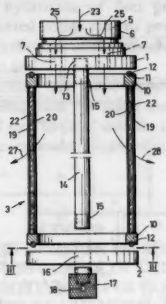
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1979, 2915730

Int. Cl.³ B01D *27/08, 46/02*

U.S. Cl. 210—450 **6 Claims**

1. In a cartridge filter for gases and liquids having a filter element clamped between an upper and lower cover, the improvement comprising that said filter includes a profile ring

composed of a epoxy resin sealing compound cast onto the upper end edge of the filter element and an identical and corresponding profile ring cast onto the lower end edge of the filter



element and sealing rings embedded in said profile rings, said profile rings each including one circumferential groove engaging around said sealing rings in a claw-like manner.

4,350,593

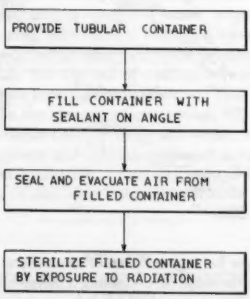
ASSEMBLY, COMPOSITIONS AND METHOD FOR SEPARATING BLOOD

Stephen B. Kessler, North Bergen, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Continuation of Ser. No. 861,676, Dec. 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 802,724, Jun. 2, 1977, abandoned, which is a continuation of Ser. No. 665,964, Mar. 11, 1976, abandoned, which is a continuation-in-part of Ser. No. 629,707, Nov. 7, 1975, abandoned. This application Jun. 25, 1979, Ser. No. 51,976

Int. Cl.³ B01D *21/26*; C07F *7/18*

U.S. Cl. 210—516 **10 Claims**


PROVIDE TUBULAR CONTAINER
FILL CONTAINER WITH SEALANT ON ANGLE
SEAL AND EVACUATE AIR FROM FILLED CONTAINER
STERILIZE FILLED CONTAINER BY EXPOSURE TO RADIATION

1. In a pre-assembled assembly for the collection and separation of blood into its light, liquid and heavy, substantially cellular phases under centrifugal force with the establishment of a non-Newtonian fluid barrier between the separated phases, wherein said assembly comprises, a tubular container having an open end and a closed end, a removable closure for said open end, and a non-Newtonian fluid disposed in said container, the improvement which comprises; as said non-Newtonian fluid a blend of from about 93 to 97 parts of a polyester prepared by the condensation of equal molar proportions of azelaic acid with a mixture of neopentyl glycol and butanediol in a molar ratio of 5:2 and having a viscosity of from 100 to 5,000 poises and a density of from 1.007 to 1.067 gms/cc with from 3 to 7 parts by weight of a fumed silica, saidblend having a specific gravity of from 1.03 to 1.09 and said fluid having substantially time independent rheological properties, said non-Newtonian fluid being inert in respect to chemical reactivity toward blood and blood components.

9. A composition, which comprises;

from 93 to 97 parts by weight of a fluid polymeric polyester prepared by the condensation of substantially equimolar proportions of azelaic acid and a mixture of neopentyl glycol and butanediol in a molar ratio of 5:2, said polyester having a viscosity of from 100 to 5000 poises at 25° C. and a density of from 1.007 to 1.067; and

from 3 to 7 parts by weight of a fumed silica.

4,350,594

BLOOD PURIFICATION USING PLURAL ULTRAFILTRATION STAGES

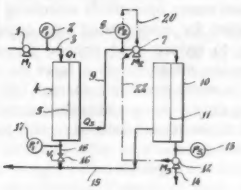
Syuji Kawai, Kurashiki; Tadayuki Yamane, Kyoto; Michio Abe, Saiki; Toshihiko Ono, Oita, and Shuji Yamauchi, Saiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki and Kawasumi Laboratories, Inc., Tokyo, both of, Japan

Filed Apr. 8, 1981, Ser. No. 252,245

Claims priority, application Japan, Apr. 16, 1980, 45-50735; Apr. 16, 1980, 45-50736

Int. Cl.³ B01D *13/00, 31/00*

U.S. Cl. 210—637 **12 Claims**



9. A method of treating blood comprising:

separating plasma from the blood in a first membrane module utilizing a semipermeable membrane having pores of a size retaining a blood corpuscular fraction and permeating a plasma fraction,

pumping said plasma through a plasma outlet circuit including a flowmeter and a first pump,

fractionating said plasma in a second membrane module into two fractions utilizing a semipermeable membrane having pores of a size permeating human blood serum albumin,

expelling a high-molecular-weight fraction separated in the second membrane module through a plasma fraction outlet circuit having a second pump positioned downstream of said second membrane module,

combining, in a blood return circuit having a valve, the low-molecular-weight fraction containing human blood serum albumin separated in said second membrane module with the blood corpuscular fraction separated in said first membrane module,

controlling said valve in association with said flowmeter so as to maintain the pressure in said plasma outlet circuit within a range of from about −40 mmHg to 40 mmHg, and

adjusting the ratio between the rate of flow of the plasma flowing into said second membrane module and the rate of plasma fraction being expelled from said second membrane module to a predetermined value by controlling the flow rate between said first and second pumps.

4,350,595
SEPARATION COLUMN FOR LIQUID CHROMATOGRAPHY AND SEALING ARRANGEMENT THEREFOR

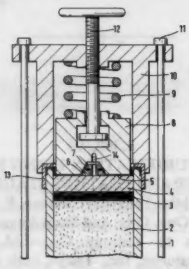
Werner Gunkel, Wingerstweg, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jun. 5, 1981, Ser. No. 270,717

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1980, 3021366

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—656 **11 Claims**



1. A separation column for liquid chromatography containing compressible column packing therein, said separation column comprising:

flexible seal means fixedly secured to one end of the column for sealing the packing containing column; and

compression means operatively associated with said flexible seal means for compressing said compressible column packing to reduce dead volume therein whereby said compression means exerts a force on said flexible seal means to cause stretching thereof into the column for reducing dead volume within the column while said flexible seal means remain secured to said one end of the column.

4,350,596
METHOD AND APPARATUS FOR RECOVERING WASTE OIL

Alvin B. Kennedy, Jr., P.O. Box 282, Angleton, Tex. 77515

Filed May 22, 1981, Ser. No. 266,201

Int. Cl.³ B01D *17/04*

U.S. Cl. 210—708 **6 Claims**

1. Method of recovering oil from a mixture of oil, water, including emulsions of oil and water, and suspended solids and polymers, which comprises the steps of:

heating the mixture;

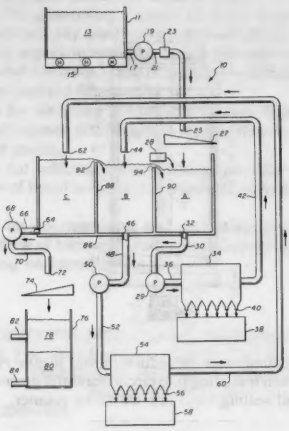
adding a de-emulsifier to the heated mixture;

passing the heated mixture with the de-emulsifier added thereto through a first vibrating screen to remove large particles and to mix thoroughly the de-emulsifier with the mixture;

adding a surface tension reducer in the heated mixture after passing said mixture through said first vibrating screen;

processing said mixture with said surface tension reducer added thereto through a hydrocyclone to remove suspended solids and to agglomerate polymers contained in said mixture;

passing said mixture after said processing step through a second vibrating screen to remove said agglomerated polymers;



and allowing said mixture passed through said second vibrating screen to settle, whereby the oil separates from the water.

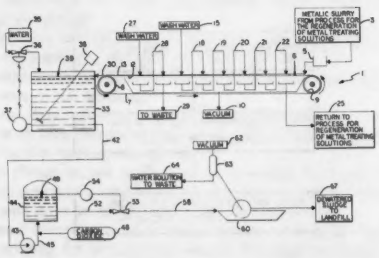
4,350,597
APPARATUS AND PROCESS FOR TREATMENT OF SLUDGE

Robert P. Selm, and Leland M. Shepard, both of Salina, Kans., assignors to Wilson & Company, Salina, Kans.

Filed Oct. 31, 1980, Ser. No. 202,690

Int. Cl.³ C02F *1/52*

U.S. Cl. 210—710 **11 Claims**


METALIC SLURRY FROM PROCESS FOR THE REGENERATION OF METAL TREATING SOLUTIONS
WATER
WASH WATER
TO WASTE
VACUUM
RETURN TO PROCESS FOR REGENERATION OF METAL TREATING SOLUTIONS
WATER SOLUTION TO WASTE
CHEMICAL STORAGE
DISPOSAL SLUDGE TO LANDFILL

1. In a process for regeneration of spent metal treating solutions including the steps of: collecting a metal-treating solution portion, said solution portion containing metal salts of a metal being treated in a treating receptacle; introducing a precipitating agent into said collected solution portion; mixing the precipitating agent and collected solution portion; settling out solids formed in the mixture to provide a supernatant solution; returning the supernatant solution to the treating receptacle; said metal salts in the metal-treating solution are at least one of a class consisting of carbonates, sulfates, chromates and aluminates; and said precipitating agent is an hydroxide of a metal selected from a class consisting of calcium, barium and strontium; the improvement including the following steps for making said solids suitable for disposal in a landfill:

(a) passing said solids through filtering means so as to substantially separate said solids from said supernatant solution and produce a sludge, including the metal hydroxide of said precipitating agent, in a substantially deliquified state;

(b) reslurrying the solids with water after separation from said supernatant solution in a vessel;

(c) injecting carbon dioxide into said reslurried solids in a purified amount to substantially react stoichiometrically with the metal hydroxide of said precipitating agent within said reslurried solids and to produce a generally water insoluble carbonate of the metal of said precipitating agent therein; and

(d) thereafter separating said solids substantially including the metal carbonates from the water associated therewith after injection of said carbon dioxide to form a substantially liquid-free component suitable for disposal in a landfill.

4,350,598

PROCESS FOR EVEN DIVISION OF SUBSTANCES AND MIXTURES OF SUBSTANCES IN THE COURSE OF MANUFACTURING OF PULVERULENT PREPARATIONS BY CHEMICAL REACTION

Friedrich Bölsing, Danziger Str. 5, D-4965-Lindhorst, Fed. Rep. of Germany

Continuation of Ser. No. 709,385, Jul. 28, 1976. This application Jan. 15, 1980, Ser. No. 111,977

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1975, 2533789

Int. Cl.³ C02C *5/02*

U.S. Cl. 210—751 **7 Claims**

1. A process for forming a uniform distribution of an oil in calcium hydroxide comprising:

A. adding calcium oxide to an oil which is in the presence of water, and

B. mechanically mixing said oil with said calcium oxide, said calcium oxide being capable of reacting with said water to form calcium hydroxide which has a surface area greater than the surface area of said calcium oxide, said mechanical mixing homogenizing said calcium oxide, water and oil so that said oil is substantially homogeneously distributed within said calcium oxide prior to the observation of the temperature increase associated with the exothermic reaction between calcium oxide and water, wherein said mechanical mixing substantially homogeneously distributes said substance within said hydroxide forming compound at a rate faster than the rate of reaction between water and said hydroxide forming compound, said mixing step being performed in the absence of compounds which delay the reaction between calcium oxide and water, and upon the reaction between said calcium oxide and water to provide said calcium hydroxide, a dust-dry substantially uniform distribution of said oil in calcium hydroxide is provided.

4,350,599

PROCESS FOR TREATMENT OF CAUSTIC WASTE LIQUORS

Ajit K. Chowdhury, Schofield, Wis., assignor to Sterling Drug Inc., New York, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,443

Int. Cl.³ C02F *1/72*

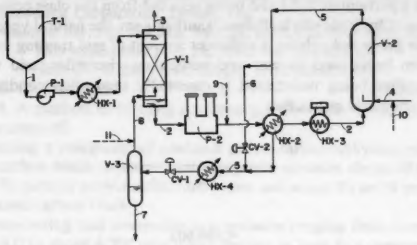
U.S. Cl. 210—761 **13 Claims**

1. A continuous process for the treatment of a caustic waste by wet oxidation in a stainless steel system, comprising the steps of:

a. initially adjusting the pH of a portion of the raw waste to below 11.0 but above 7.0 by contacting said waste with an acid or carbon dioxide;

b. oxidizing the neutralized waste obtained in step (a) with pure oxygen or air enriched with oxygen in a wet oxidation reactor to produce a gas stream rich in carbon dioxide;

c. cooling the hot reactor effluents and separating the oxidized liquor from the noncondensible gases containing carbon dioxide;



d. contacting said noncondensible gases with additional incoming raw caustic waste to neutralize said waste with the carbon dioxide content of said gases; and

e. continuously repeating steps b, c and d in a cyclic process.

4,350,600

METHOD AND COMPOSITION FOR INHIBITING CORROSION IN HIGH TEMPERATURE, HIGH PRESSURE GAS WELLS

Shelby P. Sharp, Tulsa, Okla., and Lyman Yarborough, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 29, 1979, Ser. No. 43,298

The portion of the term of this patent subsequent to Feb. 3, 1995, has been disclaimed.

Int. Cl.³ E21B *41/02*

U.S. Cl. 252—8.55 E **7 Claims**

1. A method for inhibiting corrosion in a high temperature, high pressure gas well, characterized in that an aqueous or brine phase is present, but no petroleum condensate phase exists at a bottomhole conditions, involving the steps of:

(a) producing a corrosion inhibiting composition capable of existing in a liquid phase at said bottomhole conditions comprising a dialkyl disulfide to which has been added a high molecular weight amine having from about 12 to 30 carbon atoms in a quantity in excess of about 30 parts by weight fatty amine per 100 parts by weight dialkyl disulfide, and

(b) injecting said corrosion inhibiting composition into said gas well to inhibit corrosion.

4,350,601

PREPARATION OF VISCOSIFIERS FOR ZINC SALT WORKOVER AND COMPLETION BRINES

Benjamin Mosier, Houston, Tex.; Jack L. McCrary, and Karl G. Guilbeau, both of Lafayette, La., assignors to The Dow Chemical Co., Midland, Mich.

Continuation of Ser. No. 23,672, Mar. 26, 1979, abandoned. This application May 18, 1981, Ser. No. 264,605

Int. Cl.³ E21B *43/00*

U.S. Cl. 252—8.55 R **6 Claims**

1. A viscosified zinc salt brine for use as a well fluid, comprising an aqueous solution of zinc bromide in admixture with calcium salt selected from the class consisting of calcium bromide, calcium chloride, and mixtures thereof, said solution containing sufficient zinc to provide a density of at least 15 pounds per gallon, said brine containing from 1 to 6 pounds per barrel of a treated viscosifier prepared by forming a treating solution comprising an aldehyde reagent dissolved in a solvent carrier, said aldehyde reagent being selected from the class consisting of formaldehyde, aliphatic dialdehydes containing from 2 to 6 carbons, and mixtures thereof, said solvent carrier being selected from the class consisting of organic polar solvents in which said aldehyde reagent is soluble and mixtures thereof with a minor proportion of water, said treating solution

containing from 0.5 to 15% by weight of said aldehyde reagent, and contacting said treating solution with a viscosifier suitable for use in well fluids, said viscosifier being in the form of a particulate solid and being selected from the class consisting of hydroxyethylcellulose, xanthan gum, the natural vegetable gums and gelatin, a sufficient amount of said treating solution being used to wet said particulate viscosifier, said viscosifier being maintained is essentially unswollen condition during said contacting.

4,350,602

FUSING FLUID FOR SOLDER-PLATED CIRCUIT BOARDS

Harold Schiller, 3521 Greenbrier Rd., Long Beach, Calif. 90808

Continuation-in-part of Ser. No. 198,604, Oct. 20, 1980, abandoned. This application Dec. 18, 1980, Ser. No. 218,004

Int. Cl.³ C09K *5/00;* **H05K** *3/34*

U.S. Cl. 252—75 **7 Claims**

1. A radiation fusing fluid for coating solder-plated electrical circuit boards prior to heating by radiation to fuse the solder plating, said fluid being essentially a mixture of the following:

(a) viscous water-soluble organic compounds selected from the general group consisting of: polyoxyalkylene ether containing methyl side chains and terminal hydroxyl groups; polyalkylene glycol; polyoxyalkylene glycol; polyoxyalkylene adducts of butanol: these constituting about 40 to 60 percent of the total;

(b) a volatile solvent drivable off at the solder fusing temperature of around 204° C., constituting about 60 to 40 percent of the total;

(c) an activator constituting about 1 to 3 percent of the total; and

(d) at least about 0.05 percent by weight of an additive selected from the group consisting of phenothiazine and dioctyl phenothiazine.

2. A fluid as in claim 1 wherein said activator is hydrochloric acid.

4,350,603

NOVEL TRIS-AZO DYES AND LIQUID CRYSTAL COMPOSITIONS MADE THEREWITH

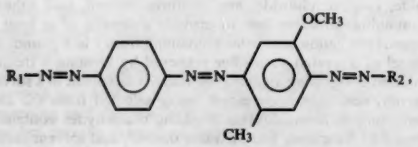
Siegfried Aftergut, Schenectady, and Herbert S. Cole, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,254

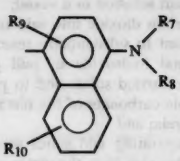
Int. Cl.³ G02F *1/13;* **C09K** *3/34;* **C09B** *31/16, 35/36, 33/22*

U.S. Cl. 252—299.1 **10 Claims**

1. A liquid crystal composition for use in a liquid crystal display, comprising a host liquid crystal material and a guest dichroic dye dissolved in said liquid crystal material, said dichroic dye having the formula,

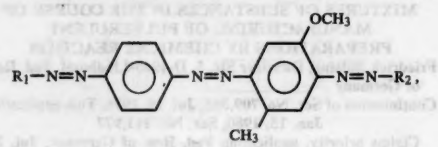


where R_1 and R_2 are selected from naphthalamine groups having the formula,

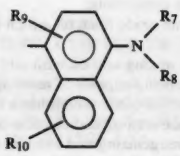


R_7 is selected from the class consisting of hydrogen, $C_{(1-6)}$ alkyl, aryl, arylalkyl and a $C_{(1-6)}$ alkyl amine radical, R_8 is selected from the class consisting of hydrogen, $C_{(1-6)}$ alkyl, and a $C_{(1-6)}$ alkyl amine radical, R_9 and R_{10} are selected from the class consisting of hydrogen, $C_{(1-3)}$ alkyl, alkoxy and halogen.

7. A tris-azo dye having the formula,



where R_1 and R_2 are selected from an aromatic amine group having the formula,



R_7 is selected from the class consisting of hydrogen, $C_{(1-6)}$ alkyl, aryl, arylalkyl and a $C_{(1-6)}$ alkyl amine radical, R_8 is selected from the class consisting of hydrogen, $C_{(1-6)}$ alkyl, and a $C_{(1-6)}$ alkyl amine radical and R_9 and R_{10} are selected from the class consisting of hydrogen, $C_{(1-3)}$ alkyl, alkoxy and halogen.

4,350,604

PHOSPHOR

Kenzo Awazu, and Kazu Matsunaga, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1981, Ser. No. 297,278

Claims priority, application Japan, Apr. 15, 1981, 56-56775

Int. Cl.³ C09K *11/30*

U.S. Cl. 252—301.4 R **3 Claims**

1. A phosphor having a matrix formulation of $Li(Al,Ga)O_2$ having an atomic ratio of Al to Ga ranging from 75:25 to 5:95, wherein 0.3 to 1.3 atomic percent of Fe^{3+} ions are incorporated in said matrix as an activator and Li is present in substantially a 1:1 stoichiometric ratio to the total of Al, Ga and Fe.

4,350,605

WATER-IN-OIL EMULSIONS

Paul D. Hughett, Marietta, Ga., assignor to Peterson/Puritan, Inc., Danville, Ill.

Filed Nov. 22, 1977, Ser. No. 854,062

Int. Cl.³ C09K *3/30*

U.S. Cl. 252—305 **43 Claims**

1. In a water-in-oil emulsion containing water, an oleaginous liquid, and an emulsifying composition, the improvement wherein the emulsifying composition is comprised of the combination of a finely divided montmorillonite mineral suffi-

ciently modified with quaternary ammonium cations containing 10 or more carbon atoms, per cation, to render the mineral compatible with the oleaginous liquid, a polar organic dispersing agent for the mineral, and a partial ester of a fatty acid of 10 to 20 carbon atoms and a saturated, aliphatic, polyhydric alcohol having 3 to 18 hydroxyl groups, at least 2 of said hydroxyl groups being unesterified.

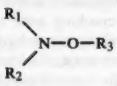
4,350,606

COMPOSITION AND METHOD FOR INHIBITING CORROSION

Dionisio G. Cuisia, Chicago, and Chih M. Hwa, Palatine, both of Ill., assignors to Dearborn Chemical Company, Lake Zurich, Ill.

Filed Oct. 3, 1980, Ser. No. 193,656
Int. Cl.³ C23F *11/14*
U.S. Cl. 252—392 24 Claims

1. Composition consisting essentially of a hydroxylamine compound having the general formula



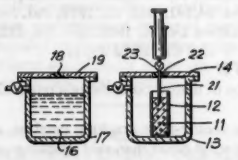
where R_1, R_2, and R_3 are either the same or different and selected from the group consisting of hydrogen, lower alkyl and aryl, and the water-soluble salts thereof, and a second neutralizing amine.

4,350,607

DETECTOR AND DOSIMETER FOR NEUTRONS AND OTHER RADIATION

Robert E. Apfel, 210 Goffe Ter., New Haven, Conn. 06511

Division of Ser. No. 820,059, Jul. 28, 1977, Pat. No. 4,143,274.
This application Sep. 11, 1978, Ser. No. 941,489
The portion of the term of this patent subsequent to Mar. 6, 1996, has been disclaimed.
Int. Cl.³ C09K *3/00*
U.S. Cl. 252—408 21 Claims



1. A composition including droplets of superheated liquid encapsulated in a host immiscible therewith, said host being a member of the group consisting of viscous liquids, greases and soft gels, said viscous liquid and grease being of high enough viscosity to protect said droplets from initiation of vaporization by contact with a wall, and said gel being soft enough to allow essentially the full volume change corresponding to the vaporization of any droplets at the ambient temperature and pressure about said gel, said composition being useful in the detection of radiation.

4,350,608

OXYGEN CATHODE FOR ALKALI-HALIDE ELECTROLYSIS AND METHOD OF MAKING SAME

Lawrence J. Gestaut, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Division of Ser. No. 899,548, Apr. 24, 1978, Pat. No. 4,278,525.
This application Feb. 19, 1981, Ser. No. 236,027
Int. Cl.³ C25B *11/06;* H01M *4/04;* B27J *5/00*
U.S. Cl. 252—425.3 4 Claims

1. A method of forming a porous gas electrode comprising the steps of:

forming a composite of prefused polytetrafluoroethylene and carbon black, wherein said composite contains about 10 to 70 percent polytetrafluoroethylene and about 90 to 30 percent carbon black;

compressing said composite at a pressure ranging from about 100 to about 4,000 psig while heating at least to a temperature above the sinter temperature of said polytetrafluoroethylene and below the decomposition temperature thereof;

maintaining said temperature and pressure for a period of 5 to 60 minutes to form an electrode substrate;

and applying an electrocatalyst to said substrate.

2. The method as described in claim 1 wherein said step of applying an electrocatalyst comprises the steps of:

applying a solution of chloroplatinic acid to said substrate;

initially reducing said chloroplatinic acid to platinum by heating said electrode substrate; and

completing said reduction by contacting said electrode substrate with a reducing solution.

3. A method as in claim 2 wherein said heating is conducted at a temperature of about 400° F.

4,350,609

PROCESS FOR PRODUCING A CATALYST BY DEPOSITING MOLYBDENUM REMOVED FROM A WASTE CATALYST

Donald C. Cronauer, Gibsonia, Pa., and Robert B. Bjorklund, Linkoping, Sweden, assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Feb. 26, 1981, Ser. No. 238,538
Int. Cl.³ B01J *23/28*
U.S. Cl. 252—465 12 Claims

1. A process for producing a molybdenum-containing catalyst comprising:

(a) selectively removing molybdenum values from a waste molybdenum-containing catalyst also comprising aluminum, silicon, iron, titanium, cobalt or nickel in a single step comprising contacting said waste catalyst with a chlorinating gas at a temperature within the range of about 100° C. to about 600° C.;

(b) depositing molybdenum removed from said waste catalyst onto fresh alumina support by contacting the effluent gas from step (a) in the presence of air or oxygen with said fresh alumina support maintained at a temperature of about 50° C. to about 400° C.; and

(c) calcining the product of step (b) to convert the deposited molybdenum to molybdenum oxide.

4,350,610

HYDROPHOBIC CATALYST FOR RECOMBINERS

Margarete Jung, and August Winsel, both of Kelkheim, Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Apr. 9, 1981, Ser. No. 252,592
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1980, 3013753
Int. Cl.³ B01J *31/02*
U.S. Cl. 252—429 R 14 Claims

1. A catalyst for recombining hydrogen and oxygen, particularly gases evolving during operation of electric storage batteries, comprising

a mixture of polytetrafluoroethylene and Kieselgur as the

catalyst carrier material, provided with an active catalytic material, the polytetrafluoroethylene-Kieselgur mixture being formed into a rolled mat, the mat being provided after rolling with a catalytically active material, then made hydrophobic, and sintered.

4,350,611

PREPARATION OF VANADIUM PHOSPHORUS CATALYSTS USING OLEFINIC HALOGENATED ORGANIC REACTION MEDIA

Michael F. Lemanski, Cleveland; Noel J. Bremer, Stow, and Ernest C. Milberger, Solon, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 199,148, Oct. 22, 1980, Pat. No. 4,293,498. This application Apr. 10, 1981, Ser. No. 252,751

Int. Cl.³ B01J *27/14*

U.S. Cl. 252—435 24 Claims

1. A process for the preparation of oxidation catalysts containing the mixed oxides of vanadium and phosphorus which comprises

(a) introducing a pentavalent vanadium-containing compound into an olefinic, halogenated organic liquid-containing liquid medium,

(b) effecting reduction of at least a portion of said vanadium to a valence state of about +4 by heating the vanadium and olefinic, halogenated organic liquid-containing liquid medium;

(c) adding a phosphorus-containing compound to said medium before or after effecting said reduction to form a catalyst precursor;

(d) recovering the catalyst precursor;

(e) drying the catalyst precursor;

(f) calcining the catalyst precursor.

4,350,612

METHOD FOR PREPARING A MAGNESIUM HALIDE SUPPORT FOR CATALYSTS

Carl C. Greco, Garnersville, N.Y., and Kelly B. Triplett, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 13, 1981, Ser. No. 224,765

Int. Cl.³ C08F *4/02, 4/64*

U.S. Cl. 252—441 20 Claims

1. A process for preparing an effective support for the titanium halide component of a coordinate complex catalyst for the polymerization of alpha-olefins comprising the steps of:

(a) intimately contacting a magnesium or manganese chloride or bromide with a drying agent at an elevated temperature,

(b) milling the magnesium or manganese chloride or bromide so as to activate its surface; and

(c) repeat contacting step (a) and milling step (b) for two or more cycles, whereby the effective support is produced.

4,350,613

CATALYST FOR PURIFYING EXHAUST GASES AND METHOD FOR MANUFACTURING SAME

Atsushi Nishino, Neyagawa; Kunio Kimura, Hirakata; Kazunori Sonetaka, Hirakata, and Yasuhiro Takeuchi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Mar. 10, 1981, Ser. No. 242,176

Claims priority, application Japan, Mar. 11, 1980, 55-31186; Mar. 11, 1980, 55-31187; Jul. 24, 1980, 55-102155

Int. Cl.³ B01J *21/04, 21/06, 23/58, 23/64*

U.S. Cl. 252—455 R 18 Claims

1. A catalyst for purifying an exhaust gas which comprises a carrier substantially composed of calcium aluminate and 5 to 90 wt% of titanium oxide based on the amount of carrier, and a catalytic component of a platinum group metal, or a metal oxide capable of oxidizing reductive gases into innoxious ones, and supported on said carrier when said platinum group metal is used, and in an amount of 0.1 to 10 wt% when said metal oxide is used.

4,350,614

CATALYTIC CRACKING CATALYST

Albert B. Schwartz, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 59,805, Jul. 23, 1979, abandoned, and a continuation of Ser. No. 897,077, Apr. 17, 1978, Pat. No. 4,265,787, which is a division of Ser. No. 869,079, Jan. 13, 1978, Pat. No. 4,174,272, which is a division of Ser. No. 659,308, Feb. 19, 1976, which is a continuation-in-part of Ser. No. 649,261, Jan. 15, 1976, Pat. No. 4,072,600, which is a continuation-in-part of Ser. No. 599,920, Jul. 28, 1975, which is a continuation-in-part of Ser. No. 440,890, Feb. 8, 1974, abandoned, and a continuation-in-part of Ser. No. 399,008, Sep. 20, 1973, abandoned. This application Sep. 26, 1980, Ser. No. 191,092

Int. Cl.³ B01J *29/12, 29/16*

U.S. Cl. 252—455 Z 6 Claims

1. A solid, acid, porous hydrocarbon cracking catalyst that contains about 0.01 to 100 parts per million, based on said catalyst, of at least one metal of the group consisting of platinum, palladium, iridium, osmium, rhodium, ruthenium and rhenium in a form inherently capable of dehydrogenting gas oil; which catalyst has substantial activity to catalyze the endothermic cracking, in a cracking zone of a catalytic cracking apparatus, of gas oil boiling range hydrocarbons at elevated tempertures and in the absence of added hydrogen, with concomitant deactivation during said cracking by reasons of the deposition of coke thereon, in an amount not substantially higher than the amount of coke, based upon feed, which would have been deposited on said catalyst under the same operating conditions in the absence of said incorporated metal; which catalyst in its coked condition is adapted to be transported to a regeneration zone of said apparatus and therein, in combination with sufficient oxygen, to be exothermically regenerated and heated by burning coke thereof to produce a heated, reactivated catalyst and a flue gas having a higher ratio of carbon dioxide to carbon monoxide than said flue gas would have using said catalyst without said metal; which heated, reactivated catalyst is adapted to be returned to said cracking zone; and which catalyst acquired a portion of said metal content while in said cracking apparatus.

4,350,615

CATALYTIC CRACKING WITH REDUCED EMISSION OF NOXIOUS GAS

Garbis H. Meguerian, Olympia Fields; John M. Lorntson, Will County, and Iacovos A. Vasalos, Downers Grove, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 84,141, Oct. 12, 1979, Pat. No. 4,300,997. This application Dec. 4, 1980, Ser. No. 212,883

Int. Cl.³ B01J *29/12*

U.S. Cl. 252—455 Z 8 Claims

1. A composition of matter comprising a particulate physical mixture of:

(a) a particulate zeolite-type cracking catalyst; and

(b) a particulate solid other than said cracking catalyst comprising an inorganic oxide in association with palladium and ruthenium, wherein the palladium and ruthenium are in free or combined form, the ratio by weight of an elemental basis of palladium to ruthenium is from about 0.1 to about 10, the combined amount of palladium and ruthenium is from about 0.001 to about 10 weight percent with respect to the particulate solid other than said cracking catalyst, and the combined amount of palladium and ruthenium is from about 0.01 to about 100 parts per million by weight with respect to said particulate physical mixture.

2. The composition as set forth in claim 1 wherein the amount of said cracking catalyst is from about 50 to about

99.999 weight percent with respect to said particulate physical mixture.

3. The composition as set forth in claim 2 wherein the combined amount of palladium and ruthenium is from about 0.1 to about 25 parts per million by weight with respect to said particulate physical mixture.

4,350,616

METHOD OF MAKING CATALYSTS FOR THE PRODUCTION OF ETHYLENE OXIDE

Anne S. Boussert, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 3, 1980, Ser. No. 165,512
Int. Cl.³ B01J *21/04, 23/02, 23/04, 23/66*
U.S. Cl. 252—463 9 Claims

1. In a process for making an improved silver catalyst for use in producing ethylene oxide, wherein ethylene and oxygen are reacted in the vapor phase at an elevated temperature in the presence of said catalyst, by

(a) impregnating a porous alumina support by contacting said support with an aqueous solution of a silver salt,

(b) drying said impregnated support

(c) impregnating said dry support with a reducing agent selected from high boiling organic esters, mineral oil or mixtures thereof by contacting said support with said reducing agent,

(d) heating said support to reduce said silver salt on said support to silver metal and to remove residual reducing agent, the silver metal made thereby characterized in having a predominance of particles of no more than about one micron in diameter,

the improvement which consists of:

(1) impregnating said silver-containing support with cesium by contacting said silver-containing support with a solution of cesium compound in a lower alkanol, and

(2) heating said cesium-impregnated silver-containing support at a temperature sufficient to remove said lower alkanol.

4,350,617

CYLINDRICAL METAL HONEYCOMB CATALYST SUPPORTS, AND METHOD FOR FORMING THEM

William B. Retallick, 1432 Johnny's Way, West Chester, Pa. 19380, and Harold R. Smithson, 880 E. Street Rd., Box 11, Westtown, Pa. 19395

Filed Apr. 20, 1981, Ser. No. 255,568
Int. Cl.³ B01J *35/04*
U.S. Cl. 252—477 R 10 Claims

1. A frame for a metal catalyst support, comprising a cylindrical shell and at least one partition that is parallel to the straight line that generates the cylindrical shell, wherein the frame encloses a plurality of indented metal strips, the strips being laid parallel to the partition, the strips being oriented so that indentations on adjacent strips do not coincide, so that adjacent strips cannot nest together.

4,350,618

THICK FILM CONDUCTORS FOR USE IN MICROELECTRONIC PACKAGING

David G. Hilson; Gary W. Johnson, both of Norwalk, Conn., and Ronald J. Schoonejongen, Lake Carmel, N.Y., assignors to Electro Materials Corp. of America, Mamaroneck, N.Y.

Filed Nov. 16, 1979, Ser. No. 94,900
Int. Cl.³ H01B *1/02;* H01L *23/48;* C09D *5/10*
U.S. Cl. 252—514 5 Claims

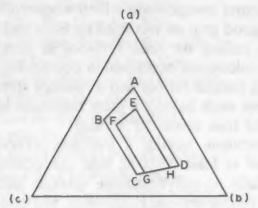
1. A thick film conductor suitable for use in association with Si-based integrated circuits in a eutectic die attachment process, said thick film conductor comprising by weight, about 87.88% Au, 1.41% Pd, 0.43% Pt, 1.41% ZnO and the remainder being Bi_2O_3 and glass frit in a ratio of about 2 to 1, said Pd having a surface area of at least about five meters²/gram.

4,350,619

GRANULAR DETERGENT CONTAINING ZEOLITE, SILICATE, LAS AND OLEFIN SULFONATE

Masayoshi Nakamura, Chiba; Teruo Magari, Funabashi; Seiji Abe, Kokubunji, and Mitsuyoshi Yazaki, Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Apr. 21, 1981, Ser. No. 256,157
Claims priority, application Japan, Apr. 23, 1980, 55-54627
Int. Cl.³ C11D *1/14, 1/22, 3/12, 11/02*
U.S. Cl. 252—537 4 Claims



1. A zeolite-containing non phosphate granular detergent composition comprising:

(a) at least one α-olefin sulfonate having 14 to 20 carbon atoms,

(b) at least one linear alkylbenzene sulfonate having 10 to 14 carbon atoms in the alkyl group thereof,

(c) at least one sodium silicate having the general formula of $Na_2O.nSiO_2$, wherein n is a number of from 2.0 to 2.6, and

(d) at least one type A zeolite, the total amount of the components (a) and (b) being 20 to 25% by weight of the total amount of the composition, the amount of the component (d) being 10 to 20% by weight of the total amount of the composition and the weight ratio of the components (a), (b) and (c) being within the area enclosed by the points A [(a):(b):(c)=64:21:15], B [(a):(b):(c)=45:15:40], C [(a):(b):(c)=12:48:40] and D [(a):(b):(c)=17:68:15] defined in the accompanying triangular diagram.

4,350,620

PROCESS FOR FILTERING AND ENCAPSULATING RADIOACTIVE PARTICLES

Edmund Hartinger, Baden; Elias Jülke, Wettingen, and Harald Sandmann, Nussbaumen, all of Switzerland, assignors to Maschinenfabrik Meyer AG, Deitingen, Switzerland

Filed Apr. 18, 1980, Ser. No. 141,353
Claims priority, application Switzerland, May 14, 1979, 4448/79
Int. Cl.³ G21F *9/16*
U.S. Cl. 252—628 25 Claims

1. A method for removing a particulate solid radioactive matter dispersed in an aqueous process stream from said stream comprising the steps of:

(1) filtering said process stream containing said dispersed radioactive matter through a filter medium consisting of at least predominantly of a water-wettable but substantially water-insoluble polymer material that is thermally fusible at temperatures in the range of from about 100° C. to about 300° C. whereby there are produced (A) a filtered aqueous stream substantially free of said solid radioactive matter and (b) a filter residue containing said thermally fusible polymer material and said particulate solid radioactive matter; and

(2) heating said filter residue to a temperature in said range of from about 100° C. to about 300°for at least partially interfusing said thermally fusible polymer material whereby there is produced a compacted mixture of said particulate solid radioactive matter and said at least partially interfused polymer material.

4,350,621

ELASTOMER COMPOSITIONS FOR TIRE TREAD

Robert Bond, Staffordshire, and Robert J. Blythe, Birmingham, both of England, assignors to Dunlop Limited, London, England

Continuation of Ser. No. 937,121, Aug. 28, 1978, abandoned. This application Jun. 26, 1980, Ser. No. 163,278

Claims priority, application United Kingdom, Sep. 9, 1977, 37824/77

Int. Cl.[3] C08L *7/00, 9/06, 23/20*

U.S. Cl. 525—237 13 Claims

1. An elastomer composition which when vulcanized can be used to give good grip on wet road surfaces and low frictional resistance to rolling on road surfaces in tires whose tread contains the vulcanized composition comprising

a blend of a natural rubber and a rubbery styrene-butadiene copolymer each having a glass transition temperature of no greater than minus 50° C. and

a polyisobutylene having a viscosity average molecular weight of at least 250,000, said composition containing substantially no polybutadiene wherein said natural rubber, said rubber-styrene copolymer, and said polyisobutylene are present in quantities sufficient to yield a vulcanized composition displaying good grip on wet road surfaces and low frictional resistance to rolling on road surfaces in tires whose treads contain the vulcanized composition.

4,350,622

AQUEOUS DISPERSIONS OF VINYLIDENE CHLORIDE RESINS

Kazuhiko Hiyoshi; Norio Matsuura; Michiharu Matsugichi, all of Nobeoka; Norio Onofusa, and Tadao Nishikage, both of Yokohama, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Aug. 10, 1981, Ser. No. 291,728

Int. Cl.[3] C08L *35/04*

U.S. Cl. 524—831 2 Claims

1. An aqueous dispersion of a vinylidene chloride copolymer resin obtained by emulsion polymerizing a mixture of vinylidene chloride as a major component, methacrylic acid, methyl methacrylate and, optionally, acrylonitrile; said aqueous dispersion containing: (a) from about 87 to about 93 mole percent, based on polymer solids content, vinylidene chloride units; (b) from about 13 to about 7 mole percent, based on polymer solids content, of a mixture of acrylonitrile and methyl methacrylate, said mixture having a molar ratio of acrylonitrile to methyl methacrylate of from about 0 to 1 to about 1 to 1; (c) from about 1×10^{-4} to about 3×10^{-4} moles of methacrylic acid units per gram of said polymer solids content, with the further limitation that the content of methacrylic acid existing in a form titratable with a 1/20 N aqueous solution of sodium hydroxide does not exceed either about 1.3×10^{-4} moles per gram of polymer solids content or about 50 percent of the total methacrylic acid content, whichever is smaller.

4,350,623

PHENOLATED NAPHTHALENE FORMALDEHYDE RESIN VARNISH

Joseph G. Robinson, Winchcombe, and Sally A. Brain, Evesham, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Feb. 19, 1981, Ser. No. 236,064

Claims priority, application United Kingdom, Mar. 25, 1980, 8009948

Int. Cl.[3] C08K *5/05*

U.S. Cl. 524—391 6 Claims

1. A varnish for preparing glasscloth laminates for use at high temperatures comprising a solvent, about 50% w/w of a resin and a curing agent for the resin, wherein the solvent is a lower secondary alcohol and the resin consists essentially of a phenolated naphthalene formaldehyde resin having a molecular weight from 350 to 500 and a combined phenol content from 37 to 54% w/w.

4,350,624

METHOD FOR RECOVERING MEAT PROTEINS REMAINING ATTACHED TO THE BONES AFTER THE BONING OPERATION

Jean-Frederic Herubel, Guebwiller, France, assignor to N. Schlumberger & Cie, Guebwiller, France

Filed Jan. 9, 1980, Ser. No. 110,792

Claims priority, application France, Jan. 11, 1979, 79 00638

Int. Cl.[3] A23J *1/02*

U.S. Cl. 260—112 R 9 Claims

1. A method for recovering proteins from meat attached to bones comprising the steps of:

(a) mechanically comminuting the bones into fragments,

(b) contacting the bone fragments with an aqueous solution of an alkaline base having a pH of from about 10 to 12 at room temperature, until the meat attached to the bones is released,

(c) keeping said fragments at room temperature in contact with the aqueous solution for a time sufficient to extract proteins,

(d) separating the aqueous solution containing extracted protein from the bone fragments,

(e) adjusting the pH of the separated aqueous solution down to between about 4 to 8 to precipitate the proteins from the solution, and

(f) separating the precipitated proteins.

4,350,625

SUBSTANCE WITH FIBRINOLYTIC ACTIVITY AND METHOD OF MANUFACTURING THE SAME

Takeshi Abe, 36-5, Kitazawa 1-chome, Setagaya-ku, Tokyo, 115, Japan

PCT No. PCT/JP79/00296, § 371 Date Jul. 20, 1980, § 102(e) Date Jul. 3, 1980, PCT Pub. No. WO80/01039, PCT Pub. Date May 29, 1980

PCT Filed Nov. 16, 1979, Ser. No. 201,390

Claims priority, application Japan, Nov. 20, 1978, 53-143224

Int. Cl.[3] A23J *1/00;* C09H *1/00;* A61K *37/00*

U.S. Cl. 260—112 R 7 Claims

7. A substance with a strong plasminogen activator activity obtained by subjecting a solution of venom of Trimeresurus to multiple chromatography consisting essentially of a combination of: providing a first molecular sieve chromatography using Sephadex G-75 or G-100; thereafter providing a second molecular sieve chromatography using Sephadex G-50 as a stationary phase; and, at a time before or after or intermediate said first and second chromatographies, carrying out ion exchange chromatography using a cation exchange body as a stationary phase; fractionating each protein-containing solution eluted in turn during each stage of said first second and ion exchange chromatographies using a buffer solution of electrolyte with pH 6–8 as a mobile phase; confirming the plasminogen activator activity of each of the fractionated portions; collecting the fractionated portions having the largest plasminogen activator activity dialyzing said largest activity fractionated portions in distilled water; and subjecting said largest activity portions to an operation of separation by subsequent chromatography, thereby singly isolating a substance with plasminogen activator activity, which substance has its maximal absorption spectrum in the proximity of ultraviolet ray, 278 nm and infrared ray, around 3400 cm^{-1} (large scale), 1640 cm^{-1} (medium scale), 14355 cm^{-1} (large), 1350 cm^{-1} (large), 1250^{-1} (small scale), 1100 cm^{-1} (medium), 1025 cm^{-1} (small), 925 cm^{-1} (medium) and 780 cm^{-1} (small) respectively and having a molecular weight within the range of 28,000–35,000 and observed to have a glycoprotein having a total mount of nitrogen, 12.4±1%, being soluble in water and capable of operating a plasminogen activator, the amino acids of the

substance being present in a relative N mol quantity as follows,

Aspartic acid	15.366
Threonine	7.132
Serine	5.578
Glutamic acid	9.797
Glycine	9.475
Alanine	7.668
Cystine	5.454
Valine	7.422
Methionine	2.936
Isoleucine	4.836
Leucine	7.215
Tyrosine	8.923
Phenylalanine	2.895
Lysine	17.729
Ammonia	13.278
Histidine	1.793
Arginine	3.674.

4,350,626
ANTITUMOR HYBRID AND PROCESS FOR THE PREPARATION THEREOF

Yasuhiko Masuho, Hino, and Takeshi Hara, Hachioji, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jul. 21, 1980, Ser. No. 170,332
Claims priority, application Japan, Jul. 20, 1979, 54-91634
Int. Cl.[3] C07C *103/52;* **C07G** *7/00;* **A61K** *37/00*
U.S. Cl. 260—112.5 R **6 Claims**

1. Antitumor protein hybrid comprising (1) a moiety which is substantially the fragment Fab of an antitumor immunoglobulin and (2) a moiety which is the subunit A of ricin, which is expressed by the following formula (I):

$$Fab(S_1\text{-}(X)_n\text{-}S_2\text{-}RA)_m \quad (I)$$

where Fab indicates a moiety which is substantially the fragment Fab of an antitumor immunoglobulin; RA indicates a moiety which is the subunit A of ricin; X indicates a divalent organic radical; S_1 and S_2 are both sulfur atoms, S_1 indicating a sulfur atom arising from the disulfide bond in the immunoglobulin and S_2 a sulfur atom arising from the disulfide bond in ricin; n represents 0 or 1 and m represents an integer of 1 to 5.

4,350,627
BIOLOGICALLY ACTIVE PEPTIDES

Roberto de Castiglione; Fiorenzo Faoro; Giuseppe Perseo; Silvano Piani, and Francesco Santangelo, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Italy

Continuation-in-part of Ser. No. 120,832, Feb. 12, 1980, abandoned. This application Dec. 3, 1980, Ser. No. 212,586
Claims priority, application United Kingdom, Sep. 20, 1979, 7932590; Sep. 15, 1980, 8015412
Int. Cl.[3] C07C *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 E **131 Claims**

1. A biologically active peptide selected from the group consisting of
H-Tyr-ala-Phe-Gly-Tyr-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-NH_2,
H-Tyr-ala-Phe-Gly-OMe,
H-Tyr-ala-Phe-Gly-OH,
H-Tyr-ala-Phe-Gly-NH_2,
H-Tyr-ala-Phe-Gly-NH-NH_2,
H-Tyr-ala-Phe-Sar-NH-NH_2,
H-Tyr-ala-Phe-Sar-NH-NH-Z,
Boc-Tyr-ala-Phe-Sar-NH-NH_2,
Boc-Tyr-ala-Phe-Phe-NH-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-Pro-NH_2,
H-Tyr-ala-Phe-Gly(Bzl)-Pro-NH_2,
Boc-Tyr-ala-Phe-Gly-Tyr-Pro-NH_2,
Boc-Tyr-ala-Phe-Gly-Tyr(Bzl)-Pro-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-Ser-NH_2,
Boc-Tyr-ala-Phe-Gly-Tyr-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-Hyp-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr(Bzl)-Hyp-Ser(Bzl)-NH_2,
Boc-Tyr-ala-Phe-Gly-Tyr-Hyp-Ser-NH_2,
Boc-Tyr-ala-Phe-Gly-Tyr(Bzl)-Hyp-Ser(Bzl)-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-Val-Ser-NH_2,
Boc-Tyr-ala-Phe-Gly-Tyr-Val-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-Gly-Ser-NH_2,
Boc-Tyr-ala-Phe-Gly-Tyr-Gly-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Phe-Pro-Ser-NH_2,
Boc-Tyr-ala-Phe-Gly-Phe-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Phe-Hyp-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Phe-Hyp-Ser(Bzl)-NH_2,
Boc-Tyr-ala-Phe-Gly-Phe-Hyp-Ser-NH_2,
Boc-Tyr-ala-Phe-Gly-Phe-Hyp-Ser(Bzl)-NH_2,
H-Tyr-ala-Phe-Gly-Trp-Pro-Ser-NH_2,
Boc-Tyr-ala-Phe-Gly-Trp-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Phe-Tyr-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Phe-Tyr(Bzl)-Pro-Ser-NH_2,
Boc-Tyr-ala-Phe-Phe-Tyr-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-Pro-Ser-NH-NH-Z,
H-Tyr-ala-Phe-Gly-Tyr-NH-NH-Z,
H-Tyr-ala-Phe-Gly-NH-NH-Z,
H-Tyr-ala-Phe-Gly-NH-NH-CO-CH_2-CH_2-CH_3,
H-Tyr-ala-Phe-Gly-NH-NH-tyr-H,
H-Tyr-ala-Phe-Sar-NH-NH-Z,
Boc-Tyr-ala-Phe-Sar-NH-NH-Z,
H-Tyr-ala-Phe-Sar-Tyr-NH-NH-Z,
Boc-Tyr-ala-Phe-Sar-Tyr-NH-NH-Z,
H-Tyr-ala-Phe-Sar-Tyr-NH-NH-Boc,
Tfa-Tyr-ala-Phe-Sar-Tyr-NH-NH-Boc,
H-Tyr-ala-Phe-Gly-Tyr-NH-NH-Ph,
Boc-Tyr-ala-Phe-Gly-NH-NH-Ph,
H-Tyr-ala-Phe-Gly-Tyr-NH-NH-Boc,
Tfa-Tyr-ala-Phe-Gly-Tyr-NH-NH-Boc,
H-Tyr-ala-Phe-Gly-Tyr-NH-NH-Adoc,
Tfa-Tyr-ala-Phe-Gly-Tyr-NH-NH-Adoc,
H-Tyr-ala-Phe-Gly-Tyr-NH-NH-Ad,
Boc-Tyr-ala-Phe-gly-NH-NH-Ad,
H-Tyr-ala-Phe-Gly-Leu-NH_2,
H-Tyr-ala-Phe-Gly-Met-NH_2,
H-Tyr-ala-Phe-Sar-Tyr-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Gly-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-Pro-Ser-NHMe,
H-Tyr-ala-Phe-Gly-Tyr-Pro-Ser-NHEt,
H-Tyr-ala-Phe-Gly-Tyr-Pro-Ser-OMe,
H-Tyr-met-Phe-Gly-NHNHZ,
H-Tyr-met(O)-Phe-Gly-NHNHZ,
H-Tyr-ala-Phe-Gly-NHNHLrl,
H-Tyr-ala-Phe-Gly-MHNHBnl,
H-Tyr-ala-Phe-Gly-tyrNHNH$_2$,
H-Tyr-ala-Phe-Gly-NHNHAdoc,
H-Tyr-ala-Phe-Gly-NHNHBoc,
H-Tyr-ala-Phe-Gly-Pro-NH_2,
H-Tyr-ala-Phe-Gly-Ser-NH_2,
H-Tyr-ala-Phe-Gly-tyr-NH_2,
H-Tyr-ala-Phe-Sar-Tyr-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-Sar-Ser-NH_2
H-Tyr-ala-Phe-Gly-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-Pro-Ser-NH-NH_2,
H-Tyr-met-Phe-Gly-Tyr-NH_2,
H-Tyr-met-Phe-Gly-Tyr-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Pro-Tyr-Pro-Ser-NH_2,
H-Tyr-ala-Phe-MePhe-Tyr-Pro-Ser-OMe,
H-Tyr-ala-Phe-Gly-Tyr-Ppa-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-Aze-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-Tia-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-ΔPr-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Phe(NO_2)-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-Pro-Abu-NH_2,
H-Tyr-ala-Phe-Tyr-Pro-Gly-NH_2,
H-Tyr-ala-Phe-Gly-Tyr(Bzl)-Pro-Ser(Bzl)-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-Pro-Ser(Bzl)-NH_2,

H-Tyr-ala-Phe-Gly-Tyr-NH-Ad,
H-Tyr-ala-Phe-Gly-Tyr-Pro-Ser-OH,
H-Tyr-ala-Phe-Gly-Tyr-NH-Ch_2CF_3,
H-Tyr-ala-met-Phe-Gly-$NHNH_2$,
H-Tyr-ala-Phe-Gly-tyr-NHNHZ,
H-Tyr-ala-Phe-Gly-Met(O)-NH_2,
H-Tyr-ala-Phe-Gly-Nva-NH_2,
H-Tyr-met-Phe-Gly-Pro-NH_2,
H-Tyr-met-Phe-Gly-Nva-NH_2,
H-Tyr-met(O)-Phe-Gly-Tyr-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Sar-Tyr-Hyp-Ser-NH_2,
H-Tyr-ala-Phe-Sar-Tyr(Bzl)-Hyp-Ser(Bzl)-NH_2,
H-Tyr-ala-Phe-Gly-Tyr(Bzl)-Ppa-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-alloHyp-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-3Hyp-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr(Bzl)-3-Hyp-Ser(Bzl)-NH_2,
H-Tyr-ala-Phe-Gly-Tyr(Bzl)-Aze-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr(Bzl)-Tia-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr(Bzl)-ΔPr-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-βAla-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Phe(F)-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Cha-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Phg-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr(Me)-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-Pro-Ser-NH-$CH(CH_3)_2$,
H-Tyr-met(O)-Phe-Gly-$NHNH_2$,
H-Tyr-ala-Phe-Sar-Tyr-$NHNH_2$,
H-Tyr-ala-Phe-Phe-NH-NH_2,
H-Tyr-ala-Phe-MePhe-Tyr-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Gly-Tyr-MeAla-Ser-NH_2,
H-Tyr-ala-Phe-Phe-NH-NHZ,
H-Tyr-ala-Phe-Gly-Tyr-NH-NH_2,
H-Tyr-ala-Phe-Gly-Leu-NH-NHZ,
H-Tyr-ala-Phe-Gly-Tyr(Me)-Hyp-Ser-NH_2,
H-Tyr-ala-Phe-Tyr(Bzl)-alloHyp-Ser-(Bzl)-NH_2,
H-Tyr-ala-Phe-MePhe-Tyr-Pro-Ser-OH,
H-Tyr-ala-Phe-Sar-Tyr(Bzl)-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Pro-Tyr(Bzl)-Pro-Ser-NH_2,
H-Tyr-ala-Phe-Pro-Tyr-Hyp-Ser-NH_2,
H-Tyr-ala-Phe-Pro-Tyr(Bzl)-Hyp-Ser(Bzl)-NH_2, and
H-Tyr-ala-Phe-Gly-Tyr-3alloHyp-Ser-NH_2,
and a pharmaceutically acceptable salt thereof.

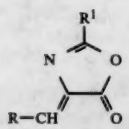
4,350,628

PREPARATION OF DEHYDROPEPTIDES

Charles H. Stammer, Athens, Ga., assignor to Research Corporation, New York, N.Y.

Division of Ser. No. 80,210, Oct. 1, 1979, Pat. No. 4,283,328, which is a division of Ser. No. 921,239, Jul. 3, 1978, abandoned.
This application Mar. 24, 1981, Ser. No. 247,006
Int. Cl.³ C07C *103/52;* C09B *23/00*
U.S. Cl. 260—112.5 R **10 Claims**

1. A method of preparing compounds represented by the formula (II)



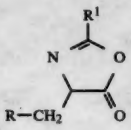
wherein

R is a straight- or branched-chain alkyl group of from 1 to 8 carbon atoms, which may be unsubstituted or substituted by hydroxyl, methylthio, guanidino or amino;

a phenyl or naphthyl group, which may be unsubstituted or substituted by hydroxyl, iodo or phenoxy; or

a 5-membered ring containing at least one nitrogen atom and at least 3 carbon atoms or a 5-membered ring containing one nitrogen atom and 4 carbon atoms fused to a benzene ring, which may be unsubstituted or substituted by hydroxyl; and

R^1 is an N-blocked amino acid residue or peptide chain or stereoisomer thereof; which comprises reacting a compound represented by the formula (I)



wherein

R and R^1 are as defined above in an organic solvent with a benzoguinone oxidizing agent in the presence of a base having a pK of about 6 to 8 and recovering the product.

4,350,629

PROCEDURES FOR PREPARING COMPOSITE MATERIALS FROM COLLAGEN AND GLYCOSAMINOGLYCAN

Ioannis V. Yannas, Newton Center, Mass., and Martin J. Forbes, Kirkland, Canada, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 29, 1981, Ser. No. 287,998
Int. Cl.³ C07G *7/00;* C08H *1/00, 1/06*
U.S. Cl. 260—123.7 **6 Claims**

1. A method for preparing a crosslinked collagen-glycosaminoglycan composite material, comprising:

a. soaking collagen in an aqueous acidic solution having a pH of below about six;

b. contacting said solution with a crosslinking agent; and

c. contacting a source of glycosaminoglycan with said solution.

4,350,630

CONTINUOUS EXTRACTION OF CAPROLACTAM FROM AN AQUEOUS SOLUTION CONTAINING CAPROLACTAM AND ITS OLIGOMERS

Hugo Fuchs, Ludwigshafen; Uwe Brand, Rosengarten; Ernst Deuker, Gruenstadt, and Elmar Frommer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 25, 1981, Ser. No. 276,815
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1980, 3026538
Int. Cl.³ C07D *201/16*
U.S. Cl. 260—239.3 A **4 Claims**

1. In a process for continuously extracting caprolactam from an aqueous solution, containing caprolactam and its oligomers, with organic solvents, by introducing the aqueous solution into the upper part of an extraction zone and organic solvents into the lower part, and taking off a solution of caprolactam in organic solvents at the upper end and an aqueous phase containing caprolactam oligomers at the lower end, the improvement that liquid aromatic hydrocarbons are used and the extraction is carried out at a pH of from 2.0 to 6.0.

4,350,631
6- AND 4-SUBSTITUTED-1-AZABICYCLO[3.2.0]HEPTAN-3,7-DIONE-2-CARBOXYLATES

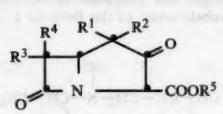
Burton G. Christensen, Scotch Plains, and David H. Shih, Manalapan, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 217,931, Dec. 18, 1980, abandoned. This application Mar. 18, 1981, Ser. No. 245,005

Int. Cl.[3] **C09D** *487/04*

U.S. Cl. 260—245.2 T **7 Claims**

1. A compound having the structure:



wherein R^1, R^2, R^3 and R^4 are independently selected from the group consisting of hydrogen, (R^1 and R^2 are not both hydrogen), substituted and unsubstituted: alkyl, alkenyl, and alkynyl, having from 1–10 carbon atoms; cycloalkyl, cycloalkylalkyl, and alkylcycloalkyl, having 3–6 carbon atoms in the cycloalkyl ring and 1–6 carbon atoms in the alkyl moieties; spirocycloalkyl having 3–6 carbon atoms; phenyl; aralkyl, aralkenyl, and aralkynyl wherein the aryl moiety is phenyl and the alkyl chain has 1–6 carbon atoms; wherein the substituent or substituents relative to the above-named radicals are selected from the group consisting of: amino, mono-, di-, and trialkylamino, hydroxyl, alkoxyl, mercapto, alkylthio, phenylthio, sulfamoyl, amidino, guanidino, nitro, chloro, bromo, fluoro, iodo, cyano, and carboxy; and wherein the alkyl moieties of the above-recited substituents have 1–6 carbon atoms; R^5 is hydrogen, salt cation, a pharmaceutically acceptable ester moiety or a removable blocking group.

4,350,632
WATER-SOLUBLE PHTHALOCYANINE COMPOUNDS

Hartmut Springer, Königstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

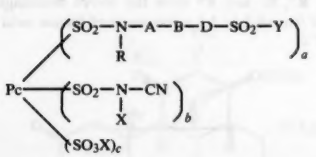
Filed Jul. 6, 1981, Ser. No. 280,814

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1980, 3025790

Int. Cl.[3] **C09B** *47/04, 47/28*

U.S. Cl. 260—314.5 **8 Claims**

1. A phthalocyanine compound of formula (1)



(1)

in which

Pc is the radical of the copper, cobalt or nickel phthalocyanine additionally not substituted or substituted by chlorine or phenyl in the 3- and/or 4-positions of the carboxylic aromatic rings of the phthalocyanine, the sulfonylcyanamide, sulfonamide and/or sulfonic acid groups being linked in the 3- and/or 4-positions of the carboxylic aromatic rings of the phthalocyanine,

a is a whole or fractional number from 1 to 3,

b is a whole or fractional number from 1 to 3 and

c is a whole or fractional number from zero to 2,

a, b and c being identical or different from one another, but the total of (a+b+c) is equal to a whole or fractional number from 2 to 4,

R is hydrogen or alkyl of 1 to 4 C atoms,

A is a direct bond or a group of the formula $-(CH_2)_m-$ or $-(CH_2)_n-NH-$ in which m is 1, 2, 3 or 4 and n is 2, 3, 4, 5 or 6,

B is phenylene or naphthylene, each unsubstituted or substituted by substituents selected from the group consisting of alkyl of 1 to 4 C atoms, alkoxy of 1 to 4 C atoms, halogen, carboxy, sulfo, carbamoyl, sulfamoyl, alkylsulfonyl of 1 to 4 C atoms, carboalkoxy of 2 to 5 C atoms, acetylamino and nitro,

D is a direct bond or a group of the formula $-CH_2-$ or $-CH_2-CH_2-$,

Y is vinyl, β-sulfatoethyl, β- phosphatoethyl, β-thiosulfatoethyl, β-hydroxyethyl or β-chloroethyl, and

X is hydrogen or the equivalent of a monovalent, bivalent or trivalent metal.

4,350,633
N-(2-SUBSTITUTED-1-OXOALKYL)-2,3-DIHYDRO-1H-INDOLE-2-CARBOXYLIC ACID DERIVATIVES

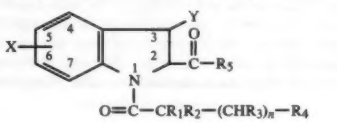
Dong H. Kim, Wayne, and Ronald J. McCaully, Malvern, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 164,992, Jul. 1, 1980, Pat. No. 4,303,583, which is a continuation-in-part of Ser. No. 65,817, Aug. 13, 1979. This application Jul. 20, 1981, Ser. No. 284,433

Int. Cl.[3] **C07D** *209/04, 209/42*

U.S. Cl. 260—326.11 R **14 Claims**

1. A compound of the formula:



wherein:

n is 1 or 0;

R_1 is hydrogen, lower alkyl, aryl, or aralkyl;

R_2 is hydrogen or lower alkyl;

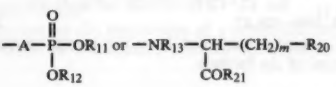
R_3 is hydrogen, lower alkyl or aroyl;

R_5 is hydroxy, amino, or lower alkoxy;

X is hydrogen, hydroxy, lower alkyl, lower alkoxy or halogen;

Y is hydrogen, lower alkyl, or aryl;

R_4 is



wherein:

A is 0, NR_{13} or S;

R_{11} and R_{12} are, independently, hydrogen, lower alkyl, aralkyl or aryl;

R_{13} is hydrogen or lower alkyl;

m is 0, 1, 2, or 3;

R_{20} is hydrogen or aryl; and

R_{21} is hydroxy or lower alkoxy;

or pharmaceutically acceptable salts thereof, wherein aryl is phenyl or phenyl substituted by a halogen, lower alkyl, or lower alkoxy group; aralkyl is benzyl or benzyl substituted on the phenyl ring by a halogen, lower alkyl, or lower alkoxy group; and aroyl is benzoyl or benzoyl substituted as above for phenyl.

4,350,634
N-BENZOYL-N'-3-INDOLYL-N'ALKYL-1,3-DIAMINO-PROPANES

Paul Stadler, Biel-Benken, and Franz Troxler, Bottmingen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

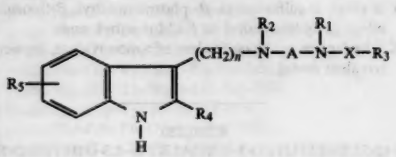
Continuation-in-part of Ser. No. 922,520, Jul. 7, 1978, abandoned. This application Jan. 11, 1980, Ser. No. 111,445

Claims priority, application Switzerland, Jul. 12, 1977, 8583/77; Jul. 12, 1977, 8584/77; Jul. 12, 1977, 8585/77; Jul. 12, 1977, 8586/77; Jul. 12, 1977, 8587/77; Jul. 12, 1977, 8588/77; Jul. 12, 1977, 8589/77; Mar. 20, 1978, 3008/78

Int. Cl.³ C07D *209/12;* **A61K** *31/40*

U.S. Cl. 260—326.13 B **5 Claims**

1. A compound of the formula



wherein

n is 2 or 3,

A is trimethylene optionally monosubstituted by (C_{1-4})alkyl, or 1,4-cyclohexylidene,

R_1 is hydrogen or (C_{1-5})alkyl,

R_2 is hydrogen or (C_{1-5})alkyl,

R_3 is unsubstituted phenyl,

R_4 is hydrogen,

R_5 is hydrogen, and

X is —CO—,

in free base form and in pharmaceutically acceptable salt form.

4,350,635
N(2-PYRROLIDINYLMETHYL)META-SULFONAMIDO-BENZAMIDES

Masaru Ogata, Kobe, and Hiroshi Matsumoto, Takatsuki, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

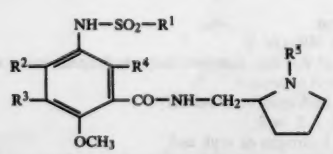
Division of Ser. No. 872,584, Jan. 26, 1978, abandoned. This application Feb. 26, 1980, Ser. No. 124,726

Claims priority, application Japan, Jan. 27, 1977, 52-8443; Aug. 8, 1977, 52-94884

Int. Cl.³ C07D *207/09;* **A61K** *31/40*

U.S. Cl. 260—326.47 **25 Claims**

1. A compound selected from the group consisting of a compound of the formula



wherein R^1 is methyl, ethyl, propyl, butyl or phenyl, R^2 is hydrogen, chlorine, fluorine, methyl, ethyl, methoxy or dimethylamino, R^3 is hydrogen, methyl or methoxy, R^4 is hydrogen or chlorine, and R^5 is ethyl, allyl, cyclohexyl, benzyl or p-fluorobenzyl, and

a pharmaceutically acceptable acid addition salt thereof.

4,350,636
PREPARATION OF PHENYLACETONITRILES CARRYING BASIC SUBSTITUENTS

Gerhard Kastner, Ludwigshafen-Maudach; Hardo Siegel, Speyer, and Karl-Heinz Geiss, Beindersheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

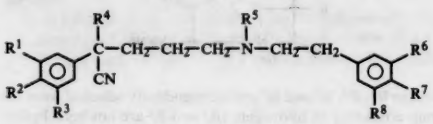
Filed Aug. 27, 1981, Ser. No. 296,893

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034221

Int. Cl.³ C07D *317/60;* **C07C** *121/78*

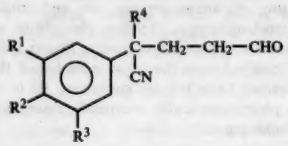
U.S. Cl. 549—435 **1 Claim**

1. A process for the preparation of phenylacetonitriles, carrying basic substituents, of the formula I



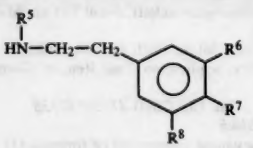
I

where R^1, R^2 and R^3 are hydrogen, halogen, trifluoromethyl or C_1–C_6-alkoxy, and R^1 and R^2 together can also be methylenedioxy, R^4 and R^5 are C_1–C_6-alkyl, R^6 and R^7 are C_1–C_6-alkoxy or together are methylenedioxy, and R^8 is hydrogen or C_1–C_6-alkoxy, which comprises reacting an aldehyde of the formula II



II

where R^1, R^2, R^3 and R^4 have the above meanings, with from 0.8 to 1.5 equivalents of an amine of the formula III



III

where R^5, R^6, R^7 and R^8 have the above meanings, in the presence of from 0.8 to 1.5 equivalents of formic acid at from 20° to 150° C.

4,350,637
SUBSTITUTED LACTONES OF AMINO ACIDS

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Andre Teche, Paris, all of France, assignors to Roussel Uclaf, Paris, France

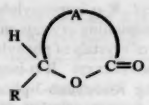
Filed Dec. 3, 1980, Ser. No. 212,569

Claims priority, application France, Dec. 10, 1979, 79 30201

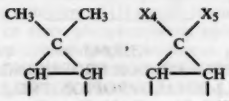
Int. Cl.³ C07D *307/77, 307/32, 309/30*

U.S. Cl. 549—304 **8 Claims**

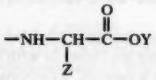
1. A substituted lactone of amino acids in all their possible stereoisomeric forms or mixtures thereof of the formula:



wherein A is selected from the group consisting of an aliphatic hydrocarbon of 2 to 3 carbon atoms optionally containing a double bond, a monocyclic hydrocarbon of 3 to 6 carbon atoms optionally containing one unsaturation, a bicyclic hydrocarbon of 5 to 10 carbon atoms containing one unsaturation,



and X_4 and X_5 are individually selected from the group consisting of hydrogen, fluorine, chlorine, bromine and alkyl of 2 to 6 carbon atoms or taken together with the carbon atoms to which they are attached form a carbon homocycle of 3 to 7 carbon atoms and R is:



wherein Z is the organic remainder of an amino acid of the group consisting of leucine, phenylalanine and methionine Y is derived from an alcohol selected from the group consisting of primary aliphatic alcohols of 1 to 12 carbon atoms, primary cycloaliphatic alcohols of 4 to 8 carbon atoms and benzyl alcohol.

4,350,638

BRUCEOLIDES

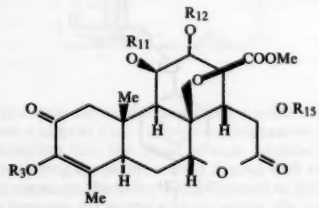
Kuo-Hsiung Lee, Chapel Hill, N.C., assignor to Research Corporation, New York, N.Y.

Filed Oct. 3, 1980, Ser. No. 193,601

Int. Cl.³ C07D *493/04*

U.S. Cl. 549—275 **1 Claim**

1. A compound of the formula



wherein R_3 is benzoyl, trimethoxybenzoyl, bruceantinyl malonyl, bruceantinyl succinoyl, bruceantinyl glutaroyl, and lower alkanoyl at 1 to 5 carbon atoms, brusatolyl malonyl, brusatolyl succinoyl, brusatolyl glutaroyl,

R_{15} is benzoyl, trimethoxybenzoyl, dihydrosenecioyl and lower alkanoyl 1 to 5 carbon atoms or senecioyl where R_3 is brusatolyl succinoyl or brusatolyl glutaroyl,

R_{11} and R_{12} are hydrogen or lower alkanoyl of 1 to 5 carbon atoms.

4,350,639

PREPARATION OF MALEIC ANHYDRIDE

Ernest C. Milberger, Solon; Noel J. Bremer, Stow, and Dennis E. Dria, Cleveland, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 146,971, May 5, 1980, Pat. No. 4,333,853. This application Apr. 29, 1981, Ser. No. 258,712

Int. Cl.³ C07D *307/60*

U.S. Cl. 549—259 **16 Claims**

1. A process for the production of maleic anhydride by the oxidation of n-butane, n-butene, 1,3 butadiene or a mixture thereof with molecular oxygen or an oxygen-containing gas in the vapor phase at a reaction temperature of 250° C.–600° C. in the presence of a catalyst containing the mixed oxides of vanadium and phosphorus, wherein said catalyst is prepared by

(a) introducing a substantially pentavalent vanadium-containing compound and a pentavalent phosphorus-containing compound into an organic liquid medium capable of reducing the vanadium to a valence state less than +5;

(b) effecting the reduction of at least a portion of the vanadium to a valence state of +4 while in the presence of the phosphorus-containing compound and in the absence of a corrosive reducing agent by heating the vanadium-containing reducing medium of step (a);

(c) recovering the mixed vanadium phosphorus oxide-containing catalyst precursor;

(d) drying the catalyst precursor;

(e) calcining the catalyst precursor to form the active oxidation catalyst.

13. A process for the production of maleic anhydride by the oxidation of n-butane, n-butene, 1,3-butadiene or a mixture thereof with molecular oxygen or an oxygen-containing gas in the vapor phase at a reaction temperature of 250° C.–600° C. in the presence of a catalyst comprising the mixed oxides of vanadium and phosphorus, said catalyst characterized by an average valence state of vanadium from about +3.9 to about +4.6, a phosphorus to vanadium ratio of about 1:1 to about 1.2:1, wherein the macrostructure of the catalyst predominantly comprises generally spheroid particles consisting of stacks of integrally associated sheets of catalytic material.

4,350,640

PREPARATION OF SUBSTITUTED (CYCLO)ALKANECARBOXYLIC ACID α-CYANO-3-PHENOXY-BENZYL ESTERS

Rainer Fuchs; Fritz Maurer, both of Wuppertal; Uwe Priesnitz, Unna-Massen, and Hans-Jochem Riebel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

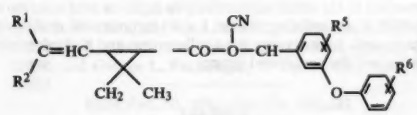
Filed Jul. 30, 1980, Ser. No. 173,545

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1979, 2933496

Int. Cl.³ C07C *120/00*

U.S. Cl. 260—465 D **11 Claims**

1. A process for the preparation of a substituted (cyclo)alkanecarboxylic acid α-cyano-3-phenoxy-benzyl ester of the formula



in which

R^1 is hydrogen, methyl, fluorine, chlorine or bromine and

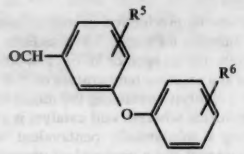
R^2 is methyl, fluorine, chlorine, bromine, C_1–C_2-fluoroalkyl or C_1–C_2-chlorofluoroalkyl, phenyl, phenyl substituted by halogen and/or by an optionally halogen-substituted C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio or C_1–C_2-alkylenedioxy radical, or

R^1 and R^2 together are C_2–C_5-alkanediyl, comprising adding

an aqueous solution or suspension of at least an equimolar amount of a water-soluble cyanide to a mixture of an alkanecarboxylic acid chloride of the formula

R—CO—Cl

and a 3-phenoxy-benzaldehyde of the formula



in a hydrocarbon solvent which is virtually immiscible with water at a temperature between about 0° and 80° C.

4,350,641

4-TERT.-BUTOXYPHENYLGLYCINONITRILE AND THE PREPARATION OF D-(−)- AND L-(+)-4-HYDROXYPHENYLGLYCINE

Dieter Degner, Dannstadt-Schauernheim; Hans J. Pander, Roedersheim-Gronau, and Hardo Siegel, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 31, 1980, Ser. No. 221,540

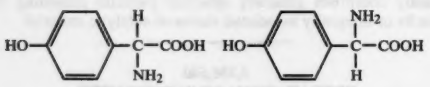
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1980, 3002543

Int. Cl.³ C07C *121/80, 99/10, 101/30*

U.S. Cl. 260—465 E **3 Claims**

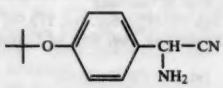
1. 4-tert.-Butoxyphenylglycinonitrile (I).

2. A process for the preparation of D-(−)-4-hydroxyphenylglycine (IIa) and L-(+)-4-hydroxyphenylglycine (IIb)



IIa IIb

which comprises: reacting DL-4-tert.-butoxyphenylglycinonitrile (I)



I

in alcoholic solution and in the presence of a carbonyl compound, with about the equimolar amount of L-(+)-tartaric acid or D-(−)-tartaric acid and the D-(−)-I-L-(+)-tartrate or L-(+)-I-D-(−)-tartrate thereby obtained in crystalline form is converted to IIa or IIb respectively in aqueous acid solution at 20°–110° C. by splitting off the L-(+)-tartaric acid or D-(−)-tartaric acid, hydrolyzing the nitrile group and hydrolytically splitting off the tert.-butyl group.

4,350,642

PROCESS FOR PREPARATION OF A PESTICIDAL PHENYLACETATE ENANTIOMER PAIR

Walter L. Petty, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 16, 1981, Ser. No. 244,372

Int. Cl.³ C07C *121/66, 121/75*

U.S. Cl. 260—465 D **23 Claims**

1. A method for the preparation of an enantiomer pair phenylacetate Y consisting of an S-α-cyano-3-phenoxybenzyl S-α-isopropylphenylacetate and the corresponding R-α-cyano-3-phenoxybenzyl R-α-isopropylphenylacetate, which process comprises precipitating crystals enriched in phenylacetate X in the presence of crystals of phenylacetate X, consisting of S-α-cyano-3-phenoxybenzyl R-α-isopropylphenylacetate and the corresponding R-α-cyano-3-phenoxybenzyl S-α-isopropylphenylacetate, from a solution of the corresponding racemic R,S-α-cyano-3-phenoxybenzyl R,S-α-isopropylphenylacetate, separating the phenylacetic X-enriched crystals from the mother liquor, redissolving the crystals in a solvent and treating the resulting solution with a base to epimerize the dissolved enantiomer pair phenylacetate X to the corresponding racemic mixture, recycling the racemic mixture back to the precipitation step and recovering mother liquor enriched in phenylacetate Y.

4,350,643

PROCESS FOR PRODUCING 2,3-DIHALOPROPIONITRILE

Shosuke Nagai, Yokohama; Toshio Kato, Kawasaki; Chojiro H. Iguchi; Nobuyuki Kawashima, both of Kamakura; Ryuichi Mita, Kawasaki; Akihiro Yamaguchi, Kamakura, and Takao Takano, Fujisawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Dec. 12, 1980, Ser. No. 215,818

Claims priority, application Japan, Dec. 18, 1979, 54-163586; Jan. 23, 1980, 55-5864

Int. Cl.³ C07C *120/00, 121/16*

U.S. Cl. 260—465.7 **11 Claims**

1. A process for producing a 2,3-dihalopropionitrile which comprises halogenating acrylonitrile with a halogenating agent in the presence of, as a catalyst, a carbonate of an alkali metal or an alkaline earth metal, or a hydrogen carbonate of an alkali metal or an alkaline earth metal, or a hydrogen phosphate of an alkali metal or an alkaline earth metal, the halogenating agent being chlorine or bromine, the halogenation being carried out in substantially the absence of irradiation by light, and the halogenation being carried out at −70° to 110° C.

4,350,644

ISOPROPYLBENZENE DERIVATIVES

John Stevens, and Stephen Newman, both of Harlow, England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

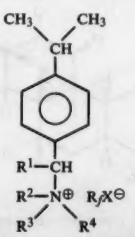
Filed May 14, 1979, Ser. No. 38,699

Claims priority, application United Kingdom, May 15, 1978, 19554/78

Int. Cl.³ C07C *143/02*

U.S. Cl. 260—501.15 **10 Claims**

1. An isopropylbenzene having the general formula:



in which:

R^1=CH_3, R^2=R^3=R^4=H and R_fX^- is $C_8F_{17}SO_3^-$,
R^1=R^4=CH_3, R^2=R^3=H and R_fX^- is $C_8F_{17}SO_3^-$,
R^1=R^3=R^4=CH_3, R^2=H and R_fX^- is $C_8F_{17}SO_3^-$,
R^1=R^2=R^3=R^4=CH_3 and R_fX^- is $C_8F_{17}SO_3^-$,
R^1=R^2=H, R^3=R^4=CH_3 and R_fX^- is $C_8F_{17}SO_3^-$,
R^1=R^2=R^3=H, R^4=CH_3 and R_fX^- is $C_8F_{17}SO_3^-$,

R^1=CH_3, R^2=C_2H_5, R^3=R^4=H and R_fX^- is $C_8F_{17}SO_3^-$,
R^1=C_3H_7, R^2=R^3=R^4=H and R_fX^- is $C_5F_{17}SO_3^-$, and
R^1=CH_3, R^2=R^3=R^4=H and R_fX^- is $C_5F_{11}SO_2^-$.

4,350,645
METHOD FOR PRODUCING A PHOSPHORIC MONOESTER

Tomihiro Kurosaki, Osaka, and Akio Manba, Wakayama, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1980, Ser. No. 210,352
Claims priority, application Japan, Dec. 17, 1979, 54-163791
Int. Cl.³ C07F *9/141*
U.S. Cl. 260—978 **8 Claims**

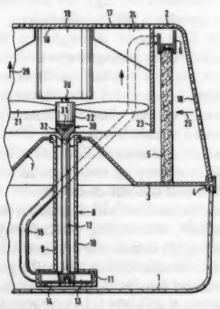
1. A method for producing a phosphoric monoester comprising reacting a mixture of (1) a mole amount, calculated as P_2O_5, of one or more phosphorylating agents (A) selected from the group consisting of phosphorus pentoxide, phosphoric acid and polyphosphoric acid, (2) 0.8 to 1.2 per mole of phosphorylating agent of water (B) including nH_2O when said phosphorylating agents are represented by $P_2O_5.nH_2O$, and (3) 0.4 to (2.8 − B) mole of an organic hydroxy compound (C) per mole calculated as P_2O_5 of phosphorylating agent, and then adding an additional amount (D) of said organic hydroxy compound to the reaction mixture, the amount of D being derived from the equation:

$$(B+C+D)/A=2.9 \text{ to } 3.1.$$

4,350,646
EVAPORATION AIR-HUMIDIFIER

Heinz G. Baus, Wartbodenstrasse 35, CH-3626 Hünibach-Thun, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,654
Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3020031
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—29 **4 Claims**

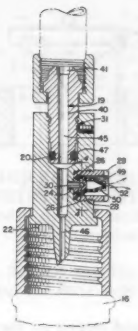


1. Evaporation air-humidifier having a water storage container with a support plate carrying an evaporation filter and a pump extending into the water storage container, a fan, a motor for driving the pump, a hood formed with air inlet and air outlet openings, the motor being fastened to the hood, and a clutch between the motor and the pump, the clutch being automatically engageable when the hood is disposed on the storage container and automatically disengageable when the hood is removed from the storage container, comprising a substantially hollow cylindrical flow channel wherein the motor and the fan are disposed, said flow channel extending from the underside of the hood at least to the fan and including stiffening ribs located at the underside of the hood and within said flow channel, said flow channel and said stiffening ribs being formed in one piece with said hood, and said flow channel having a lower edge spaced from the support plate so as to define an annular space therebetween through which air may flow.

4,350,647
PERMANENT ADAPTER FOR A MEDICAL HUMIDIFIER

Exequiel de la Cruz, Palatine, Ill., assignor to Respiratory Care, Inc., Arlington Heights, Ill.

Filed Jun. 19, 1981, Ser. No. 275,220
Int. Cl.³ B01F *3/04*; A61M *15/00*
U.S. Cl. 261—65 **6 Claims**



1. A permanent adapter for mounting on an engagable portion of a container over a pierceable seal thereon sealing therein a supply of purified or sterile water, and to be connected to a pressurized gas tube for introducing gas into the supply of water to moisten the gas, the adapter comprising:

a. two oppositely facing cups, an upper cup for connection to a gas conduit, a lower cup for connection to a container;

b. a body piece intermediate the oppositely facing cups;

c. an axial bore through the adapter;

d. a spike member for assembly within the adapter, the spike member having a tubular body defining a gas passage therein;

e. relief means in the tubular body of the spike means establishing communication between the gas passage and the outside atmosphere, the relief means being a cross T having a tubular body defining a second gas passage therethrough which is perpendicular to the gas passage of the spike means; said second gas passage extending directly outwardly from the gas passage of the spike means to the relief means;

f. audible relief valve means located in the relief means to effect audible pressure relief of the gas passage under above normal pressure conditions.

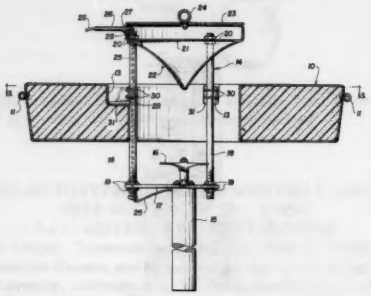
4,350,648
FLOATING AERATOR

William L. Watkins, III, Rte. 1, Box 223, Lexington, S.C. 29072; Thurston L. Chavis, Jr., Rte. 1, Box 395A, Chapin, S.C. 22036, and George L. Fuchsluger, 22 Tipton Cir., Irmo, S.C. 29063

Filed Jun. 30, 1981, Ser. No. 279,231
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—120 **2 Claims**

1. A floating aerator comprising a float body having a central through opening and having a plurality of circumferentially spaced recesses in its top face, said recesses having substantially level bottom walls and spaced substantially vertical side walls rising from the bottom walls of the recesses, a motor and deflector cone assembly including circumferentially spaced substantially vertical suspension rods corresponding in

number to the recesses and being disposed in the through opening of the float body and projecting above and below the float body, a deflector cone fixedly secured to the tops of the suspension rods and disposed at least in part above the top of the float body, a motor and impeller unit secured to the bottom of the suspension rods in coaxial relationship with the deflector cone and being spaced a predetermined distance therefrom, a plurality of substantially L-shaped support feet for said assembly corresponding in number and circumferential spacing to said recesses and suspension rods and being received remov-



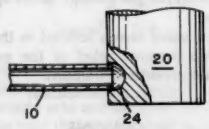
ably in the recesses and resting on the bottom walls of the recesses between the vertical side walls of the recesses, the vertical side walls preventing relative rotation of said assembly and float body around a vertical axis, and U-bolts embracing the interior sides of said suspension rods and having outer ends secured to vertical webs of the L-shaped support feet within said recesses, whereby said feet are clampingly locked to said suspension rods and able to bear the weight of said assembly and to transmit such weight to the float body through the bottom walls of the recesses.

4,350,649

METHOD FOR CLOSING AN END OF A THERMOPLASTIC TUBE USING ULTRASONIC ENERGY

Arthur M. Summo, Londonderry, N.H., assignor to Branson Ultrasonics Corporation, Newtown, Conn.

Filed Dec. 5, 1980, Ser. No. 213,416
Int. Cl.³ B29C *17/00*
U.S. Cl. 264—23 **6 Claims**



1. A method for closing an open ended thermoplastic tube comprising:

providing a horn adapted to be rendered resonant along its longitudinal axis at a predetermined frequency of vibration, said horn having a cavity disposed substantially at an antinodal region of longitudinal motion of said horn and oriented substantially normal to the longitudinal motion of said horn;

urging the open tube end into said cavity in a direction normal to the direction of longitudinal motion of said horn;

rendering said horn resonant along its longitudinal axis at its predetermined frequency while concomitantly urging the open tube end into said cavity to cause a softening and flowing of the thermoplastic tube until the tube end is formed to the shape of said cavity;

ceasing rendering said horn resonant when the desired degree of closing has occurred, thereby causing solidification of the softened and flowed material, and

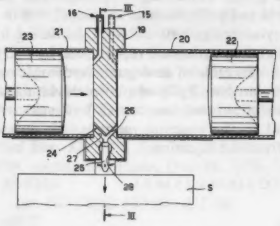
withdrawing the closed tube from said cavity.

4,350,650

METHOD FOR ADMIXING AT LEAST TWO LIQUIDS AND FEEDING THEM TO A SHAPING MOULD

Giuseppe Cereghini, Trento, Italy, assignor to Euro-Linea S.n.c. di Colombo & C., Trento, Italy

Continuation of Ser. No. 2,180, Jan. 9, 1979, abandoned. This application Dec. 24, 1980, Ser. No. 219,964
Int. Cl.³ B29F *1/03*
U.S. Cl. 264—39 **1 Claim**



1. A method for admixing at least two liquids and feeding them into a mould via first and second branched, converging throttling passageways formed in a nozzle block leading to a discharge passage and defining a first and second chamber which comprises the steps of:

feeding a first liquid through a first inlet passage into said first chamber;

circulating the first liquid under pressure between the first and second chambers through the throttling passageways to clean the chambers and passageways;

converging the first liquid through the first and second branched, converging passageways in the nozzle block for impressing on the liquid a laminar flow motion;

thereafter feeding a second liquid through a second inlet passage into said second chamber separated from the first chamber by said nozzle block;

circulating the first and second liquids back and forth under laminar flow from one to ten times in a closed loop between the first and second chambers;

converging the first and second liquids through the first and second branched, converging passageways in the nozzle block to thoroughly admix the first and second liquids and to generate a desirable sliding velocity gradient; and

feeding the admixed liquids through said discharge passage in the nozzle block directly into said mould, thus preventing incrustations of the liquids in the first and second chambers and nozzle block.

4,350,651

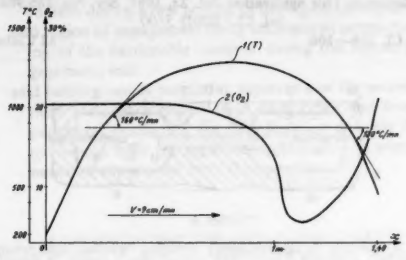
PROCESS FOR THE RAPID SINTERING OF CERAMIC COMPONENTS AND A KILN FOR CARRYING OUT SAID PROCESS

Antoinette Morell, and Antonio Hermosin, both of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 968,818, Dec. 12, 1978, abandoned. This application Aug. 26, 1980, Ser. No. 181,668
Claims priority, application France, Dec. 13, 1977, 77 37469
Int. Cl.³ C04B *35/28, 35/36*
U.S. Cl. 264—65 **2 Claims**

1. A process for rapidly sintering ceramic components comprising oxides of iron, manganese and zinc mixed with a binder, wherein the unbaked components of the ceramic to be sintered,

in the shape of half-cores for telecommunication pots, have a diameter in the range of 9–14 mm and a height in the range of 2.5–4 mm, in the state of unbaked component is subjected to a heat treatment in a nitrogen atmosphere wherein said treatment has a total duration of 16 to 33 minutes, during which



treatment the curve of the temperature as a function of the time has a first part rising with a positive slope between 50° C./min. and 500° C./min., then a second part which rises then descends in passing through a maximum of 1300° C., and a third part descending with a negative slope of absolute value between 30° C./min. and 300° C./min.

4,350,652

MANUFACTURE OF ELECTRICALLY CONDUCTIVE POLYOLEFIN MOLDINGS, AND THEIR USE

Rainer Theysohn, Ludwigshafen; Klaus Boehlke, Hessheim; Erhard Seiler, Ludwigshafen, and Martin Welz, Bad Duerkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 107,903, Dec. 28, 1979, abandoned. This application Apr. 16, 1981, Ser. No. 254,937

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1979, 2901758

Int. Cl.³ B29B *1/04*

U.S. Cl. 264—104 **6 Claims**

1. A process for the manufacture of electrically conductive polyolefin moldings, which comprise

(a) 100 parts by weight of a finely divided, partially crystalline polyolefin, which has a mean particle diameter of from 10 to 5,000 μm and an intrinsic viscosity [η], measured in decalin at 130° C., of from 0.5 to 15 and

(b) from 0.01 to 30 parts by weight of an electrically conductive additive which has a maximum particle diameter of <200 μm and a mean particle diameter which is less than 1/25 of the mean particle diameter of the polyolefin (a), and has a melting point which is at least 50° C. higher than the melting point of the polyolefin (a), wherein, in a first process step (A) a finely divided molding material comprising the components (a) and (b), is produced by mixing the components (a) and (b), in a first stage (I), in a mixer, during which first stage (I), in a first sub-stage (I.1), the mixture is brought, at a mixing intensity of from 100 to 500 W/l of useful capacity, and within a period of from 2 to 50 minutes, from ambient temperature, which is below the crystallite melting point of the polyolefin (a) and is, in particular, room temperature, to the crystallite melting point of the polyolefin (a), and is immediately thereafter, in the course of a second sub-stage (I.2), subjected to a mixing intensity which is from 0.3 to 0.8 times as great as the mixing intensity in the first sub-stage (I.1) and is brought, within a period of from 0.2 to 20 minutes, from the crystallite melting point of the polyolefin (a) to a temperature which is from 3° to 40° C. above this, and immediately thereafter, in a second stage (II), is discharged from the mixer within a period of from 0.5 to 30 seconds to provide free flowing powder of polyolefin having bonded thereto said conductive additive and is either brought, within 120 seconds, to a temperature below the crystallite melting point of the polyolefin (a), or is directly processed further in a second process step (B), in which the finely divided powder blend molding material obtained from the first process step (A) is molded at above the crystallite melting point of the polyolefin (a), by a compression-molding process, under minimal shear, to give electrically conductive moldings having a specific conductivity of $>10^{-6}\Omega^{-1}cm^{-1}$, preferably of $>10^{-3}\Omega^{-1}cm^{-1}$.

4,350,653

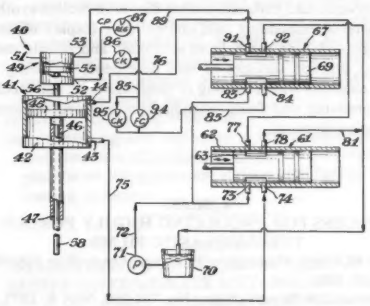
METHOD FOR THE EXTRUSION OF TETRAFLUOROETHYLENE POLYMER TUBES

Edward L. Burnett, and Eugene V. Stack, both of Bay City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 23, 1981, Ser. No. 227,840

Int. Cl.³ B01J *2/06*

U.S. Cl. 264—127 **3 Claims**



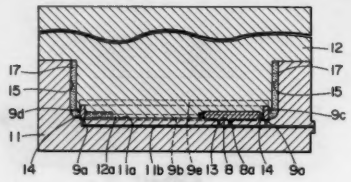
1. In a method for the fabrication of a tetrafluoroethylene polymer tube wherein a tetrafluoroethylene polymer resin is ram extruded in a ram extruder to generally fuse together particles of the tetrafluoroethylene polymer resin to provide a coherent tetrafluoroethylene polymer tube discharging the coherent tetrafluoroethylene polymer tube from the ram extruder, the ram extruder having a hollow cylindrical barrel, the barrel having a resin entrance end and a resin exit end, a hollow cylindrical ram reciprocally movable to a location within and external to the entrance end of the barrel, a generally cylindrical mandrel disposed within and passing through the hollow cylindrical ram, the mandrel extending into the barrel and terminating generally adjacent the discharge end of the barrel, the ram being in operative association with means to reciprocally position the hollow cylindrical ram generally along an axis of the direction of extrusion of the barrel and means to reciprocally position the mandrel along the axis of extrusion of the barrel,

the improvement which comprises means to continuously vary the force required to maintain the mandrel in a position generally remote from the discharge end of the barrel and to permit movement of the mandrel toward the discharge end of the barrel when a predetermined force of the ram provided by frictional engagement with the tetrafluoroethylene polymer resin has been reached.

4,350,654
METHOD OF PROVIDING DISPLAY ON MOLDED BASE

Akihiro Yoshida, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 26, 1980, Ser. No. 228,661
Claims priority, application Japan, Feb. 6, 1980, 55-13245
Int. Cl.³ B29D 3/00, 9/10
U.S. Cl. 264—129 7 Claims



1. A method of forming a base panel for a cabinet for an electrical device comprising the steps of providing a female mold with a female cavity formed with depressions for receiving one or more display elements of a first material with at least one of said display elements formed with a cross bar, placing said one or more display elements in said depressions, inserting a male mold into said female cavity of said female die, filling a space between said male and female dies with molten synthetic resin material embedding said one or more display elements, removing said base panel from said male and female molds, covering exposed surfaces of said base panel including said display elements with a coating of finish material, and mechanically removing said finish coating from exposed surfaces of said display elements.

4,350,655
PROCESS FOR PRODUCING HIGHLY POROUS THERMOPLASTIC FILMS

William H. Hoge, Flemington, N.J., assignor to Biax Fiberfilm, Neenah, Wis.

Continuation-in-part of Ser. No. 794,050, May 5, 1977, abandoned. This application Jun. 25, 1980, Ser. No. 162,684
Int. Cl.³ B29D 7/24
U.S. Cl. 264—145 15 Claims

1. A process for forming a synthetic paper-like film which comprises:

(a) admixing a thermoplastic orientable polymer with a coated inorganic filler selected from the group consisting of calcium carbonate, clays and titanium oxide in an amount sufficient to constitute at least 50 weight percent of the resulting mixture, said coated inorganic filler being coated with a fatty acid ester of the formula:

$$(A-O-)_a-M-(O-\overset{O}{\overset{\|}{C}}-C_xH_{2x}CH_3)_b$$

wherein
A=alkyl radical of from 1 to 6 carbons,
M=Si or Ti,
x=12 to 24,
a=0 to 3,
b=1 to 4, and
a+b=4.

(b) extruding said mixture at elevated temperatures to form a film thereof;

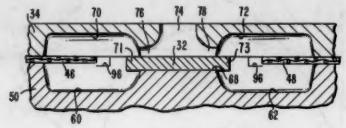
(c) cooling said film to a temperature below about 70° C.; and

(d) stretching said thus cooled film.

4,350,656
METHOD AND APPARATUS FOR CONTINUOUS MOLDING OF ARTICLES

George B. Moertel, Conneautville, Pa., assignor to Talon, Inc., Meadville, Pa.

Continuation-in-part of Ser. No. 154,650, May 30, 1980, abandoned. This application Jul. 23, 1981, Ser. No. 285,906
Int. Cl.³ B29D 5/00
U.S. Cl. 264—166 32 Claims



1. A method of continuously molding articles, comprising the steps of

continuously moving an outer continuous peripheral portion of a first molding member in a first endless path defined by the outer peripheral portion;

continuously moving a second molding member, which is band-like, in a second endless path defined by the second molding member;

continuously moving a third molding member, which is band-like, in a third endless path defined by the third molding member,

said continuous moving steps including continuously interposing the third molding member between the second molding member and the outer peripheral portion of the first molding member as the molding members pass through a region of engagement;

continuously engaging portions of the second and third molding members and the outer continuous peripheral portion of the first molding member together as they pass through the region of engagement;

said engaging step including the continuous forming of molding cavities for the articles wherein respective portions of the second molding member, the third molding member, and the outer peripheral portion of the first molding member form respective wall portions of each cavity;

injecting hardenable material into the molding cavities;

hardening the hardenable material in the molding cavities to form the articles;

continuously disengaging the second and third molding members from each other and from the outer continuous peripheral portion of the first molding member during their movement away from the region of engagement; and

removing the articles during the disengaging step.

16. An apparatus for continuously molding articles, comprising

a first molding member having an outer continuous peripheral portion defining a first endless path in which the outer peripheral portion is movable;

a second molding member, which is band-like, defining a second endless path in which the second molding member is movable;

a third molding member, which is band-like, defining a third endless path in which the third molding member is movable;

means for holding the second and third molding members and the peripheral portion of the first molding member together in engagement through a region of engagement through which the second and third molding members and the peripheral portion of the first molding member are movable;

said third endless path having at least a portion which is interposed between the second and third endless paths within a region of engagement;

said second and third molding members and said peripheral

portion of the first molding member forming molding cavities for the articles in the region of engagement wherein respective portions of the first, second and third molding members form respective wall portions of each molding cavity;

means for injecting hardenable material into the molding cavities during a first portion of the region of engagement;

said region of engagement being sufficient to permit hardening of the hardenable material during the region of engagement; and

said holding means permitting separation of the second and third molding members from each other and from the peripheral portion of the first molding member during movement from the region of engagement to permit removal of the articles from the apparatus.

4,350,657

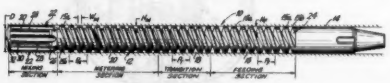
LOW-ENERGY EXTRUDER-PUMP SYSTEM

David N. Jones, Long Valley; Archibald L Burnett, Warren, and John C. Miller, Piscataway, all of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 4, 1980, Ser. No. 204,001

Int. Cl.³ B29B *1/04, 1/06*

U.S. Cl. 264—349 **8 Claims**



4. A method for the extrusion of synthetic thermoplastic materials comprising passing such materials continuously to and through a rotary extruder having a successive feeding, transition, metering and mixing section; the extruder screw forming the feeding, transition and metering sections, in cooperation with the cylindrical interior of the outer extruder housing, having equal outer diameter, thread width and lead, high thread pitch in the feeding, transition and metering sections, decreasing root depth of the threads of said transition section between relatively deep root depth in said feeding section to relatively shallow root depth in said metering section, said mixing section having a plurality of flutes formed by alternate groove and land means arranged to extend substantially longitudinally in the surface thereof and capable of substantially complete, final melting and mixing and complete homogenization of the material before discharge from the extruder; and wherein the extrudate from said extruder is successively passed through a breaker plate and an upstream adapter member, to the inlet of a rotary gear pump which, in turn, discharges, through a downstream adapter member, to a die.

5. A double-flighted melter screw for use in an extruder in combination with a gear pump to form a melting and pumping system, said melter screw successively having an inlet feeding section, a transition section, a metering section and a mixing section at the downstream end thereof, each of said feeding, transition and metering sections having an equal outer diameter, thread width and lead, high thread pitch in the feeding, transition and metering sections, decreasing root depth of the threads of said transition section between relatively deep root depth in said feeding section to relatively shallow root depth in said metering section; said mixing section having a plurality of groove means arranged to extend substantially longitudinally in the surface thereof, said groove means open at the upstream ends and closed at the downstream ends, hollow internal passage means positioned axially within said mixing section over a substantial portion of its terminal length, and a plurality of radial inlet conduits communicating between said internal passage means and the exterior of said mixing section, said inlet conduits being positioned between a pair of lands which are positioned, in turn, between said groove means.

4,350,658

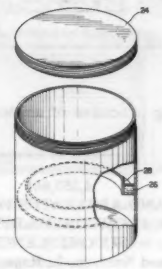
INTERIM PRESERVATION OF SURFACE COATING APPLICATORS

Floyd M. Knowlton, Forty Chirchill Ct., Fayetteville, N.Y. 13066

Filed Jun. 16, 1981, Ser. No. 274,242

Int. Cl.³ B01J *19/00;* **B65D** *81/24, 85/00*

U.S. Cl. 422—40 **12 Claims**



1. The method of preserving a coating applicator comprising

providing a sealable container including a volatile, liquid preservation agent in the interior thereof;

said container further including an interior space in gaseous communication with said liquid preservation agent;

supporting in said interior space a coating applicator having a substantial quantity of dryable liquid surface coating composition on the application surface, said coating applicator being supported out of liquid contact with said liquid preservation agent;

reversibly sealing said container;

and maintaining said applicator in said interior space and in said condition of having said dryable liquid coating composition on the application surface until further use of the coating applicator.

4,350,659

STABILIZATION OF SENSITIVE BIOLOGICALLY ACTIVE INTERMEDIATE METABOLITES SUCH AS FOLIC ACID DERIVATIVES

Louis J. Riceberg, Needham, Mass., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 30, 1981, Ser. No. 288,463

Int. Cl.³ G01N *33/68, 1/00*

U.S. Cl. 422—61 **15 Claims**

1. A method for stabilizing an intermediate metabolite which is a folic acid derivative or analog, which method comprises complexing said intermediate metabolite in a liquid medium with a complementary binder or receptor therefor and then lyophilizing said complex to yield a dry powder containing said stable complex.

4,350,660

AMMONIA GAS SENSORS

Grenville A. Robinson, Hanwell; Peter N. Kember, Ealing, and Derek K. Burns, Wendover, all of England, assignors to EMI Limited, Hayes, England

Filed May 13, 1981, Ser. No. 263,912

Claims priority, application United Kingdom, Jun. 7, 1980, 8018738

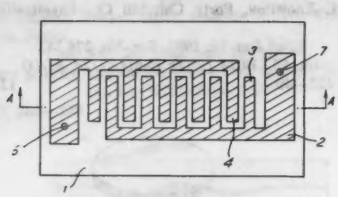
Int. Cl.³ G01N *27/04*

U.S. Cl. 422—90 **4 Claims**

1. A detector sensitive to gaseous ammonia consisting of an electrically insulating support member, an ammonia sensitive layer, consisting solely of copper phthalocyanine, mounted to the support member,

a plurality of electrodes mounted, in spaced apart relation-

ship, in electrical contact with the layer, the electrical resistance of the layer, as measured between the elec-



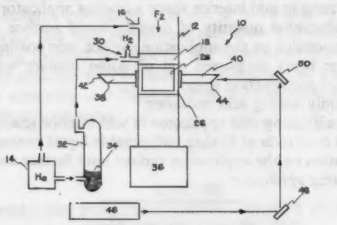
trodes, being indicative of ammonia gas sensed by the detector.

4,350,661

METHOD AND APPARATUS FOR ANALYZING SUPERSONIC FLOW FIELDS BY LASER INDUCED FLUORESCENCE

Steven J. Davis, and Nazareno L. Rapagnani, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 10, 1980, Ser. No. 110,889
Int. Cl.³ G01N *21/63, 3/091, 31/00*
U.S. Cl. 422—98 **4 Claims**



1. An apparatus for visually analyzing mixing efficiencies in a gas laser comprising:

a supply section means for providing a flow of oxidizing gases;

mixing nozzle means connected to said supply section for receiving and directing the flowing oxidizing gases provided by said supply section;

fuel supply means connected to said mixing nozzle means for supplying fuel gas to said mixing nozzle means, whereby the fuel gas is directed out of said mixing nozzle means along with said oxidizing gas,

gas injection means connected to said fuel supply means for injecting a suitable vaporous substance into the fuel gas flow from said fuel supply means for mixing therewith,

optical cavity means connected to said mixing nozzle means for receiving the mixing gases exhausted by said mixing nozzle means,

window means mounted on said optical cavity means for visually observing the gas flow in said optical cavity means, and,

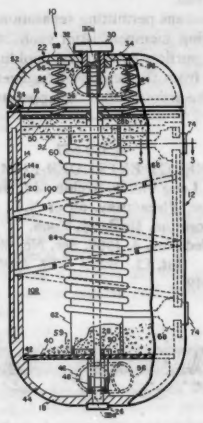
a pump laser means mounted adjacent said optical cavity means and in optical communication with the interior of said optical cavity means for irradiating a selected portion of the flowing gases to cause a visible fluorescence of the vaporous substance in that portion of the gas flow irradiated by said laser to provide a visible indication of the mixing occurring between said oxidizing gas and said fuel gas in the irradiated portion.

4,350,662

CARBON DIOXIDE ABSORBENT CANISTER WITH BREATHING GAS TEMPERATURE AND FLOW CONTROL

Ronald W. Dowgul, and Glendle W. Noble, both of Panama City Beach, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 22, 1981, Ser. No. 227,285
Int. Cl.³ A62B *7/10;* A61M *15/00;* B01D *53/14*
U.S. Cl. 422—122 **2 Claims**



1. A scrubber device for removal of carbon dioxide from breathing gas in a closed or semi-closed breathing circuit circuit diving apparatus, said device comprising:

a canister having an elongated, hollow body portion comprising an inner wall defining a chamber for containing particulate, carbon dioxide absorbent material, an outer wall spaced from said inner wall so as to define a heating water jacket space around said inner wall;

first and second canister end closure means at opposite ends of said body portion;

gas inlet and outlet ports communicating respectively with opposite ends of said chamber;

a heat exchanger column disposed concentrically in said chamber and comprising a central tube, a helical water-tube heating coil for containing particulate, carbon dioxide absorbent material having its turns distributed along and fixed to a surface of said central tube and having water inlet and outlet connections for connection to water supply and drain means;

said water inlet and outlet connections being characterized by orifice means communicating with said water jacket space, whereby a portion of heated water entering said inlet connection is passed into said water jacket space and the remainder is passed through said heating coil, whereby the inner surface of said inner wall is heated and the inner and outer surfaces of said central tube are heated so as to heat gas flowing along those surfaces and through interstices of said absorbent material.

4,350,663

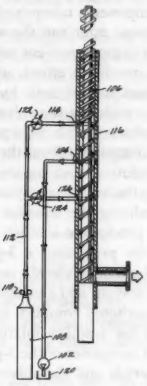
EXTRUSION APPARATUS FOR MAKING STABILIZED POLYESTER

Roy E. McAlister, 5285 Red Rock North, Phoenix, Ariz. 85018

Division of Ser. No. 32,633, Apr. 23, 1979, Pat. No. 4,243,779.
This application Dec. 11, 1980, Ser. No. 215,444
Int. Cl.³ B29F *3/02*
U.S. Cl. 422—137 **5 Claims**

1. Apparatus for applying a reactant gas to an extrudable polymer comprising:

means for containing a supply of non-fused polymer to be extruded,
an extrusion die,
a heatable extruder barrel having a receiving end in flow communication with said polymer supply containing means and a discharge end in flow communication with said extrusion die,
means for feeding a supply of non-fused polymer from said containing means to the receiving end of said barrel,
extruder screw means rotatably mounted in said barrel for moving a supply of non-fused polymer from said receiving end through said barrel and to the discharge end thereof for passage therefrom through the extrusion die,
means for heating the extruder barrel and said non-fused



polymer to fusion temperature as the polymer is moved within the barrel,
reactant gas inlet means disposed annularly in flow communication with the interior periphery of said barrel at a position between the receiving and discharge ends thereof, said inlet means being located so as to feed said reactant gas to said barrel at a position upstream from the position in the barrel where the polymer reaches its fusion temperature,
means for feeding a reactant gas to said reactant gas inlet means, and
reactant by-product gas venting means disposed annularly in flow communication with the interior periphery of said barrel at a position downstream of said reactant gas inlet means.

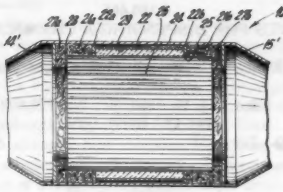
4,350,664

CATALYTIC CONVERTER FOR TREATMENT OF THE EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

Gerhard Gaysert, Esslingen am Neckar, Fed. Rep. of Germany, assignor to J. Eberspächer, Fed. Rep. of Germany

Continuation of Ser. No. 393,665, Aug. 31, 1973, abandoned.
This application Oct. 28, 1975, Ser. No. 626,616
Claims priority, application Switzerland, Sep. 9, 1972, 12966/72
Int. Cl.³ F01N *3/15*; B01J *8/06*
U.S. Cl. 422—179 **3 Claims**

1. A catalytic converter for the treatment of exhaust gases of internal combustion engines comprising:
a housing defining an axial flow passage for the exhaust gases having an annular interior wall with an entrance end and an opposite discharge end;
a monolithic ceramic honeycomb forming a catalyst carrier disposed in said flow path having exterior walls spaced radially inwardly of said-interior wall of said housing;
a metal stop disc having an opening of a size smaller than an axial cross-sectional size of said catalyst carrier connected to said interior wall of said housing and extending radially thereof into said flow passage and axially spaced from said catalyst carrier at said housing entrance end and opposite discharge end;
at least one first high temperature resistant compacted metal wire mesh disposed in the space between said carrier exterior wall and said housing interior wall adjacent said flow passage entrance and opposite discharge ends;



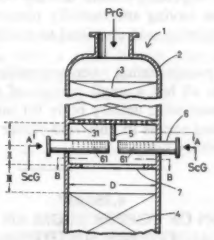
a second high temperature resistant compacted metal wire mesh disposed in the axial spacing between said catalyst carrier and each metal stop disc adjacent said flow passage entrance and discharge ends; and
a radially extending gasket disposed between said at least one first wire mesh and said second wire mesh at said flow passage entrance end for blocking a passage of exhaust gases through said at least one first wire mesh.

4,350,665

CATALYTIC REACTOR

Noboru Hashimoto, Yokohama, and Mitsu Akatsu, Kawasaki, both of Japan, assignors to JGC Corporation, Tokyo, Japan

Filed Nov. 10, 1980, Ser. No. 205,158
Claims priority, application Japan, Nov. 8, 1979, 54-144835
Int. Cl.³ B01J *8/04, 12/00, 19/24*
U.S. Cl. 422—191 **9 Claims**



1. A catalytic reactor including
a vessel having an inner diameter and a top,
a plurality of catalyst beds supported in the vessel, each having an upper surface and a bottom,
a plurality of gratings fixed in the vessel, each supporting the bottom of one of the beds,
a first gas inlet at the top of the vessel for introducing a first gas downwardly through the beds,
a second gas inlet for introducing a second gas to a space between two of the beds to be mixed with the first gas, and
a gas mixing apparatus comprising:
at least one vertical separator plate vertically mounted in said space on the downstream face of the grating supporting the upstream bed,
a second gas-distributor tube connected to the second gas inlet, the gas-distributor tube being mounted in said space below the separator plate and having multiple nozzles therein, and
a gas-dispersing plate having multiple openings and being mounted in said space below the gas-distributor tube a certain distance above the upper surface of the downstream

bed, the height of a first mixing zone being formed between or corresponding to the space between the bottom of the upstream catalyst bed and the axis of the second gas-distributor tube being at least 0.18 times the inner diameter of the vessel, and the height of the vertical separator plate being at least ½ of the height of the first mixing zone whereby substantially uniform mixing of the first and second gases results across the entire diameter of the vessel.

4,350,666

APPARATUS FOR DISPENSING A CHEMICAL INTO A FLUID

James H. Klutts, 2076 W. 9th Ave., Apache Junction, Ariz. 85220

Filed Aug. 19, 1980, Ser. No. 179,507
Int. Cl.³ B01D *11/02*
U.S. Cl. 422—263 11 Claims

1. An apparatus for dispensing a soluble chemical into a solvent fluid, comprising:

pellet means comprising a solid unitary body of said soluble chemical and having substantially planar surfaces for substantially retaining said chemical as a unitary mass prior to dissolving;

substantially encapsulating non-separable case means in contact with all but a small portion of one of said planar surfaces of said solid unitary body for initially permitting a fluid restricted access to only said planar surface portion of said solid unitary body.

4,350,667

EXTRACTION OF COPPER FROM AN AMMONIACAL COPPER SOLUTION

Sven O. S. Andersson, Kallered; Harald D. Ottertun, Mölndal, and Hans Reinhardt, Västra Frölunda, all of Sweden, assignors to MX-Processor Reinhardt & Co AB, Sweden

Filed Feb. 20, 1981, Ser. No. 236,562
Claims priority, application Sweden, Mar. 18, 1980, 8002119
Int. Cl.³ C01G *3/00*
U.S. Cl. 423—24 3 Claims

1. A method for the extraction of copper from an ammoniacal copper solution, comprising contacting the ammoniacal copper solution, in a first extraction process, with an organic phase containing an extraction reagent consisting of a beta-diketone, and subsequently contacting the ammoniacal copper solution, in a second extraction process, with an organic phase containing an extraction reagent consisting of a hydroxy oxime, a hydroxy quinoline, or an alkylaryl sulphonamide quinoline.

3. A method for the extraction of copper from an ammoniacal copper solution, comprising contacting the ammoniacal copper solution with an organic phase containing an extraction reagent consisting of a beta-ketone and an extraction reagent consisting of a hydroxy oxime, a hydroxy quinoline, or an alkylaryl sulphonamido quinoline.

4,350,668

RECOVERY OF COBALT COMPONENT FROM 3-PENTENOIC ESTER SYNTHESIS

Nobuo Isogai; Takashi Okawa; Motoyuki Hosokawa; Toshiyasu Watanabe, and Natsuko Wakui, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Mar. 20, 1981, Ser. No. 246,065
Claims priority, application Japan, Mar. 24, 1980, 55/37127
Int. Cl.³ C01G *51/00*; C07C *29/86, 67/38*
U.S. Cl. 423—139 7 Claims

1. A process for recovering cobalt component from the reaction mixture obtained by reacting butadiene, carbon monoxide and an alcohol in the presence of a solvent and a catalyst selected from cobalt carbonyl or cobalt carbonyl complex which comprises distilling the reaction mixture to remove organic volatile components comprised of the unreacted raw materials, a 3-pentenoic ester and the solvent, and contacting the residue with an organic solvent selected from the group consisting of water-insoluble ethers, aliphatic hydrocarbons, alicyclic hydrocarbons and aromatic hydrocarbons to dissolve and/or disperse the residue in the solvent, and contacting the resulting organic solution with an aqueous acid solution to extract any cobalt component from the organic solution with the aqueous acid solution, and separating the aqueous acid solution containing the cobalt component from the organic solution, and neutralizing the aqueous acid solution with an alkaline solution to precipitate a cobalt component.

7. In a process for producing a 3-pentenoic ester which comprises reacting butadiene, carbon monoxide and an alcohol in the presence of a solvent and a catalyst selected from cobalt carbonyl or cobalt carbonyl complex, the improvement which comprises distilling the reaction mixture to remove organic volatile components comprises of the 3-pentenoic ester and the unreacted raw materials and the solvent, and contacting the distillation residue with an organic solvent to dissolve and/or disperse the residue in the solvent, and contacting the resulting organic solution with an aqueous acid solution to extract any cobalt component from the organic solution with the aqueous acid solution, and separating the aqueous acid solution containing the cobalt component from the organic solution, and neutralizing the aqueous acid solution with an alkaline solution to precipitate a cobalt component.

4,350,669

PROCESS FOR CONTROLLING NITROGEN OXIDES IN EXHAUST GASES

Jun Izumi, and Nobuaki Murakami, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 762,245, Jan. 25, 1977, abandoned. This application Apr. 27, 1978, Ser. No. 900,607
Claims priority, application Japan, Jan. 30, 1976, 51-8378
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—235 3 Claims

1. In a process for the removal of NO from combustion exhaust gases wherein NO is oxidized to NO_2 and the NO_2 is removed from the resulting gas, the improvement which comprises mixing oxygen and a compound selected from the group of oxygen-containing hydrocarbon and precursors which, on being subject to oxidation, form said oxygen-containing compounds with the exhaust gas and heating the mixture to a temperature sufficient to effect oxidation of the NO therein, wherein the temperature is between 100° to 700° C., the amount of oxygen used is between 1 to 4% and the amount of oxygen-containing hydrocarbon is between 75 to 1500 ppm.

4,350,670

PROCESS FOR TREATING FLUE GAS

Shimpei Matsuda, Ibaraki; Akira Kato, Hitachi; Toshikatsu Mori, Hitachi; Teruo Kumagai, Hitachi; Yukio Hishinuma, Hitachi; Hidetoshi Akimoto, Ibaraki, and Fumito Nakajima, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 18, 1980, Ser. No. 179,238

Claims priority, application Japan, Aug. 20, 1979, 54-105032; Aug. 20, 1979, 54-105033

Int. Cl.[3] B01J *8/00*; C01B *17/00*

U.S. Cl. 423—244 7 Claims

1. A process for treating flue gas containing sulfur oxides, comprising sulfur dioxide, and dust containing at least one metal oxide capable of forming a sulfate through reaction with sulfur trioxide, comprising:

moving the flue gas through a catalyst reactor containing a shaped sulfur dioxide-oxidizing catalyst comprising at least 70% by weight on the basis of the total amount of the catalyst of titanium dioxide, and between 0.01–2% by weight of platinum, at a temperature of 350° to 500° C. and a space velocity of 200 to 100,000 hr^{-1}, thereby converting 87 to 99% of the sulfur dioxide to sulfur trioxide;

allowing the sulfur trioxide to react with the metal oxides;

absorbing the sulfur trioxide into the dust as a sulfate; and

removing the dust.

4,350,671

METHOD OF PREPARING PHOSPHORIC ACID BY A WET PROCESS

Bernard Bigot, La Londe, and Jean-Francois Gielly, Rouen, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Oct. 22, 1980, Ser. No. 199,645

Claims priority, application France, Oct. 31, 1979, 79 26993

Int. Cl.[3] C01B *25/16*

U.S. Cl. 423—320 9 Claims

1. A method of preparing phosphoric acid by a wet process from calcium phosphate and sulphuric acid in the presence of dilute phosphoric acid in a homogeneous reaction medium comprising the steps of:

(a) forming separately a primary attack slurry containing phosphoric acid and calcium sulphate products, said primary attack slurry being formed from a primary reaction medium containing reagents comprising:

(i) calcium phosphate to be treated;

(ii) sulphuric acid, said sulphuric acid being added in a quantity at least equal to the quantity necessary to convert the phosphate present to phosphoric acid but less than the quantity which results in blocking the phosphate conversion, and

(iii) a continuously-supplied recycle flux containing dilute phosphoric acid (P_2O_5);

(b) forming a final reaction medium to produce phosphoric acid and calcium sulphate products, said final reaction medium differing in composition from said primary attack slurry and comprising;

(i) from 3 to 50% of the calcium phosphate to be treated;

(ii) sulphuric acid in a quantity at most equal to the quantity needed to convert the phosphate to phosphoric acid;

(iii) a continuously-supplied recycled flux containing dilute phosphoric acid (P_2O_5), said recycled flux being introduced in a quantity less than the quantity necessary to convert calcium phosphate to monocalcium phosphate in solution; and

(iv) the separately formed primary attack slurry, said primary attack slurry having a P_2O_5 concentration 1 to 8% less than the P_2O_5 concentration in said final reaction medium; and

(c) separating the phosphoric acid product from the solid calcium sulfate product.

4,350,672

BINDERLESS CARBON OR GRAPHITE ARTICLES

George K. Layden, Jr., Glastonbury; Romeo G. Bourdeau, South Windsor, and Roscoe A. Pike, Simsbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 661,211, Feb. 25, 1976, which is a continuation of Ser. No. 481,438, Jun. 20, 1974, abandoned. This application Dec. 23, 1977, Ser. No. 863,839

Int. Cl.[3] C01B *31/00*

U.S. Cl. 423—445 18 Claims

1. A high strength, high modulus, binderless, single phase bulk carbon article having fibrillar microstructure and a Young's modulus of at least 2.5×10^7 psi (172 GPa) consisting essentially of a heat distortion flowed, unimpregnated, concomitant, self-bonded pyrolysis product of a plurality of substantially unidirectionally oriented polymer fibers.

11. A high strength, high modulus, binderless, single phase bulk carbon article having fibrillar microstructure and a modulus of rupture of at least 7000 psi (48.2 MPa) consisting essentially of a heat distortion flowed, unimpregnated, concomitant, self-bonded pyrolysis product of a plurality of two or three dimensionally oriented short-length polymer fibers.

4,350,673

METHOD OF STORING HYDROGEN

Toshio Yamashita, Katano; Takaharu Gamo, Fujiidera; Yoshio Moriwaki, Moriguchi, and Masataro Fukuda, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Division of Ser. No. 686,067, Jun. 10, 1976, abandoned. This application Feb. 2, 1979, Ser. No. 8,932

The portion of the term of this patent subsequent to Oct. 14, 1997, has been disclaimed.

Int. Cl.[3] C01B *6/24*

U.S. Cl. 423—644 6 Claims

1. A method of storing hydrogen comprising contacting gaseous hydrogen with a solid binary titanium-manganese alloy, said alloy consisting of 35 to 50 percent by weight of titanium, the remainder being manganese.

4,350,674

SUBSTITUTED ACETANILIDOIMINODIACETIC ACID COMPOUNDS, DIAGNOSTIC AGENTS CONTAINING SUCH COMPOUNDS LABELED WITH TECHNETIUM-99M, AND METHODS FOR MAKING AND USING SUCH COMPOUNDS AND AGENTS

Michael Molter, Frankfurt am Main, and Gerhard Kloss, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 16, 1980, Ser. No. 150,573

Claims priority, application Fed. Rep. of Germany, May 18, 1979, 2920174

Int. Cl.[3] A61K *49/00*, *43/00*

U.S. Cl. 424—1 22 Claims

13. A method for making a diagnostic agent for liver function studies, which method comprises preparing an aqueous solution of a tin (II) compound and member selected from the group consisting of (2,3,4,5,6-pentafluoroacetanilido-iminodiacetic acid (PFIDA) and (4-n-pentylacetanilido)-iminodiacetic acid (PIDA) in a molar ratio from 1:10 to 1:200, adjusting the pH of the aqueous solution to a value between 4 and 9, and adding a physiological saline solution containing from 0.1 l to 100 millicuries of technetium-99m.

4,350,675

CONTROLLED RELEASE GLASS

Cyril F. Drake, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 21, 1980, Ser. No. 180,068

Claims priority, application United Kingdom, Aug. 30, 1979, 7930041

Int. Cl.³ A61K *49/00, 43/00;* A45C *13/10*

U.S. Cl. 424—1 20 Claims

1. A process of dispersing a predetermined quantity of at least one metal into an aqueous medium in man, animal or a microbiological entity comprising

contacting an aqueous medium in man, animal or a microbiological entity with a water soluble glass composition consisting essentially of from 50–75 mole percent of phosphorus pentoxide as the glass forming oxide; from 1–20 mole percent of an alkali metal oxide as the principal glass modifier, the remainder including from 1–25 mole percent of an oxide selected from the group consisting of an alkaline earth metal oxide, an oxide of a metal of Group IIIA of the Periodic Table, a transition metal oxide and combinations of the foregoing, the aqueous solution time of said glass composition being controlled by adjusting the mole proportions of said oxides between the indicated ranges.

12. The process of claim 1 in which inorganic ions are dispersed from the glass composition, the ions including a tagged ion such as a radioactive isotope.

4,350,676

OPHTHALMIC USE OF CARBOXYFLUORESCEIN

Alan M. Laties, 2403 Spruce St., Philadelphia, Pa. 19103, and Richard A. Stone, 1720 Sue Ellen Dr., Havertown, Pa. 19083

Filed May 21, 1981, Ser. No. 265,934

Int. Cl.³ A61K *49/00;* G01N *21/25, 21/64*

U.S. Cl. 424—7 3 Claims

1. The method of performing ophthalmic studies comprising applying to the eye an effective amount therefor of at least one active isomer of carboxyfluorescein.

4,350,677

REAGENT FOR OPTIMIZING AGGLUTINATION

Gustav K. von Schulthess; Richard J. Cohen, both of Brookline, and George B. Benedek, Belmont, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 743,678, Nov. 22, 1976, Pat. No. 4,164,558. This application Feb. 12, 1979, Ser. No. 11,281

Int. Cl.³ G01N *33/50, 33/54*

U.S. Cl. 424—12 6 Claims

1. A composition useful to maximize sensitivity for determining the concentration of the agglutinator of the composition which comprises carrier particles coated with an antigen or antibody suspended in an aqueous medium having, to maximize particle charge, a pH as far from the isoelectric point of said antigen or antibody as possible without significantly reducing the binding capacity of the coating and the ionic strength of said aqueous medium being just below the ionic strength where nonspecific agglutination occurs so that coulomb effect and van Der Waals forces on and exerted by the particles are balanced.

4,350,678

PESTICIDE-CONTAINING PLASTIC COVERINGS FOR AGRICULTURAL CULTIVATIONS

Attilio Palvarini, Menaggio; Simone Lorusso, S. Giuliano Milanese, and Angelo Longoni, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 968,565, Dec. 11, 1978, Pat. No. 4,243,703, which is a continuation of Ser. No. 783,270, Mar. 31, 1977, abandoned. This application Aug. 5, 1980, Ser. No. 175,532

Claims priority, application Italy, Apr. 1, 1976, 21835 A/76

Int. Cl.³ A01G *13/02;* D21H *5/22;* D06N *7/06*

U.S. Cl. 424—27 3 Claims

1. Polyethylene films for covering and protecting agricultural cultivations characterized in that they hold on the surface facing the cultivation, by surface electrical charges, from 0.2 to 1050 g/m² of at least one pesticide selected from the group consisting of:

methylamide of 5(O,O-dimethyl-dithiophosphoryl)acetic acid,

O,O-diethylphthalimido-phosphonothioate,

O,O-diethyl-O-(2-isopropyl-6-methyl-pyrimidin-4-yl)phosphorothioate,

2,2-dichlorovinyl-dimethyl-phosphate, and

2,6-dinitro-N,N-dipropyl-4-trifluoromethyl-aniline, as such or in the form of formulates.

4,350,679

SOFT CAPSULE COATED WITH A FILM OF CARNAUBA WAX AND PROCESS FOR THE PREPARATION OF THE SAME

Yasuhiko Mizuno, Kagamihara, and Masanori Kayano, Honjo, both of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1981, Ser. No. 253,626

Claims priority, application Japan, May 8, 1980, 55-59981

Int. Cl.³ A61K *9/42, 9/48*

U.S. Cl. 424—38 4 Claims

1. A soft-gelatin capsule, comprising a core material containing a pharmaceutically active substance; a soft-gelatin shell encapsulating said core material, said soft-gelatin shell containing from about 5 to about 10% by weight of water; and a uniform coating film layer consisting of carnauba wax covering the external surface of said soft-gelatin shell, with the provisos that the amount of said carnauba wax is at least 0.002 parts by weight per 100 parts by weight of said shell when said shell contains about 5% by weight of water, the amount of said carnauba wax is at least 0.004 parts by weight per 100 parts by weight of said shell when said shell contains about 8% by weight of water, and the amount of said carnauba wax is at least 0.006 parts by weight per 100 parts by weight of said shell when said shell contains about 10% by weight of water.

4,350,680

DENTIFRICE

Kenneth Harvey, Wilmslow; Harry Hayes, Warrington, and Anthony J. Morton, Withington, all of England, assignors to Colgate-Palmolive Company, New York, N.Y.

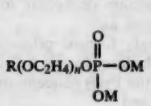
Filed Sep. 21, 1981, Ser. No. 304,438

Claims priority, application United Kingdom, Sep. 24, 1980, 8030772

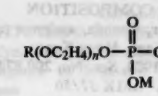
Int. Cl.³ A61K *7/16, 7/18*

U.S. Cl. 424—52 11 Claims

1. A dentifrice which reduces sloughing of oral mucosa in the oral cavity comprising 20–99% by weight of a polishing agent consisting essentially of an agent selected from the group consisting of insoluble sodium metaphosphate having a water-soluble impurity content of 2–4% by weight and a mixture of said insoluble sodium metaphosphate with up to half the total polishing agent of water-insoluble calcium or magnesium salt, and surface active agent which in combination with said insoluble sodium metaphosphate tends to cause oral sloughing, and additional anionic surface active agent in amount of at least 0.2% by weight of an anionic phosphate ester surface active agent comprising a mixture of monoester of the formula



and diester of the formula



wherein R is an alkyl group of 10–20 carbon atoms, n a number from 1–6 and M is hydrogen, alkali metal or ammonium.

4,350,681

STABILIZED BENZOYL PEROXIDE COMPOSITIONS

James E. Fulton, Jr., Key Biscayne, Fla., assignor to A.H.C. Pharmacal, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 840,339, Oct. 7, 1977, Pat. No. 4,189,501. This application Dec. 17, 1979, Ser. No. 104,629
The portion of the term of this patent subsequent to Feb. 19, 1997, has been disclaimed.
Int. Cl.³ A61K 7/20, 31/075
U.S. Cl. 424—53 13 Claims

1. A stabilized benzoyl peroxide composition, comprising from 1 to 30 weight % of benzoyl peroxide, from 5 to 50 volume % of glycerol and from 25 to 35 weight % of a mild abrasive in an aqueous medium, said composition being useful in toothpastes and as a body scrub.

4,350,682

CARTILAGE EXTRACTION PROCESSES AND PRODUCTS

Leslie L. Balassa, Blooming Grove, N.Y., assignor to Lescarden Ltd., Goshen, N.Y.

Continuation-in-part of Ser. No. 38,051, May 11, 1979, abandoned. This application Apr. 4, 1980, Ser. No. 137,547
Int. Cl.³ A61K 7/025, 35/12; A23L 1/30
U.S. Cl. 424—64 27 Claims

1. The method of producing a biologically active cartilage product which consists of:

admixing pieces of raw cartilage derived from a cartilage bearing animal, fish or reptile, with water in the ratio from about 1:100 to 100:1, cartilage to water,

heating said admixture in a confined space to a predetermined pressure between 10 and about 60 pounds per square inch at a temperature in the range between about 50° C. and 150° C.,

maintaining said admixture at said pressure and temperature for a period of time between about five minutes and five hours to form an aqueous cartilage extract containing suspended solid material, and

separating said suspended solid material from said aqueous cartilage extract to yield a separated solid material and a separated aqueous cartilage extract.

4,350,683

ANTIBODY PRODUCTION FROM HYBRID CELL LINE

Giovanni Galfre; Cesar Milstein, both of Cambridge, and Bruce W. Wright, Comberton, all of England, assignors to National Research Development Corporation, London, England

Filed Jan. 3, 1980, Ser. No. 109,391
Claims priority, application United Kingdom, Jan. 9, 1979, 7900775
Int. Cl.³ C12P 21/00; C12N 15/00, 5/00
U.S. Cl. 424—85 15 Claims

1. A substantially pure rat myeloma cell line having the C.N.C.M. designation I-078.

2. A hybrid cell line prepared from cells of the cell line C.N.C.M. I-078 through the fusion thereof with immunocyte cells from an animal sensitized to an immunogen in a nutrient medium for said cells, followed by isolation of the hybrid cell line from the resultant mixture of cells.

4,350,684

PREPARATION OF *SALMONELLA ABORTUS OVIS* STRAINS AND VACCINE COMPOSITIONS CONTAINING THEM

Pierre Pardon, Tours; Frederic Lantier, Monnaie; Jose Marly, Monnaie, and Gerard Bourgy, Monnaie, all of France, assignors to Institut National de la Recherche Agronomique, Paris, France

Filed Aug. 27, 1980, Ser. No. 181,809
Claims priority, application France, Aug. 29, 1979, 79 21685
Int. Cl.³ A61K 39/112
U.S. Cl. 424—92 16 Claims

1. A vaccine composition which comprises a biologically acceptable carrier and an alive, reverse, mutant genetically stable strain of *Salmonella abortus ovis* which is non-virulent in vivo, and immunogenic with respect to wild *Salmonella abortus ovis* and *Salmonella typhimurium.*

11. The method of immunization of a small ruminant animal susceptible to infection by salmonellosis caused by *Salmonella abortus ovis, Salmonella typhimurium* or *Salmonella dublin,* which comprises administering to such ruminants a dose sufficient to cause an immune response, a vaccine which comprises a biologically acceptable carrier and an alive, reverse, mutuant genetically stable strain of *Salmonella abortus ovis* which is non-virulent in vivo, and immunogenic with respect to wild *Salmonella abortus ovis* and *Salmonella typhimurium* and conferring immunity to the animal against said infection.

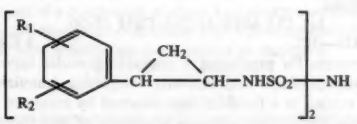
4,350,685

ANTIALLERGIC IMIDODISULFAMIDES

Faida E. Ali, Cherry Hill, and John G. Gleason, Delran, both of N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Feb. 6, 1981, Ser. No. 232,073
Int. Cl.³ A61K 31/135; C07C 143/72
U.S. Cl. 424—45 14 Claims

1. A compound of the formula (II)



(II)

wherein R_1 and R_2, independently, are hydrogen, bromo, chloro, methyl, trifluoromethyl or methoxy; or an alkali metal salt of said compound.

7. A pharmaceutical composition for inhibiting the symptoms of asthma comprising a pharmaceutical carrier or diluent and an amount sufficient to produce said inhibition of a compound of claim 1.

4,350,686

ALLERGEN COMPOSITION AND METHOD FOR PREPARATION THEREOF

Edgar R. Relyveld, and Emile Henocq, both of Paris, France, assignors to Institut Pasteur, Paris, France

Filed Oct. 6, 1980, Ser. No. 194,577
Claims priority, application France, Oct. 8, 1979, 79 24948
Int. Cl.³ A61K 39/00, 39/36
U.S. Cl. 424—88 8 Claims

1. A method for preparing a stable allergen aqueous composition which comprises the steps of:

(a) extracting allergen from a material selected from the group consisting of pollen, flour, house dust, kapok, wool and molds to form an aqueous solution and separating the solution from the solid material;

(b) precipitating the allergen from said aqueous solution and separating the precipitate;

(c) redissolving the allergen in a disodium phosphate agueous solution;

(d) shortly after step (c), fractionating the solution with respect to the molecular masses of components dissolved therein and discarding the fractions which contain components having molecular masses lower than 10,000 and those have molecular masses higher than 55,000; and

(e) recovering the fractions of said solution which contain components, the molecular masses of which are in the range of 10,000 to 55,000.

4,350,687

PLATELET DERIVED CELL GROWTH FACTOR

Allan Lipton, Hershey, and Nancy Kepner, Port Royal, both of Pa., assignors to Research Corporation, New York, N.Y.

Filed Feb. 10, 1980, Ser. No. 234,448

Int. Cl.[3] A61K *37/02;* C07G *7/00;* C12N *5/00;* C12P *21/00*

U.S. Cl. 424—177 17 Claims

1. A substantially purified glycoproteinaceous growth factor from platelets which has mitogenic activity toward transformed cells, a molecular weight of 3,000 to 5,000 daltons, a pI of 7.8–8.3, which is stable to treatment with 4 M guanidine hydrochloride, and which is heat labile when treated at 100° C. for 5 minutes, wherein said factor has mitogenic activity toward transformed cells selected from the group consisting of SV3T3, W8, and NQ-T-1 cell lines.

4,350,688

PROCEDURE FOR MANUFACTURING SAPONINE EXTRACT

Hans B. Schmittmann, Velbert, Fed. Rep. of Germany, assignor to Dr. H. Schmittmann GmbH, Velbert, Fed. Rep. of Germany

Filed Dec. 18, 1979, Ser. No. 104,792

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1979, 2900304

Int. Cl.[3] A61K *31/705;* C07J *17/00*

U.S. Cl. 424—182 8 Claims

1. A process for producing a pourable granular saponine extract product of low hygrosopicity comprising granulzing a saponine extract in a fluidized bed obtained by means of low pressure fluidization air, wherein a solution of said saponine extract is injected in said fluidized bed by means of high pressure vaporization air from directly below said fluidized bed and the temperature of said fluidized bed is from 40° C. to 80° C.

4,350,689

COMBINATIONS OF AGENTS WHICH GIVE ENHANCED ANTI-INFLAMMATORY ACTIVITY

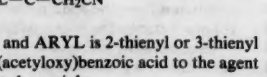
Adolph E. Sloboda, New City, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 219,750, Dec. 23, 1980, Pat. No. 4,325,949. This application Nov. 19, 1981, Ser. No. 322,789

Int. Cl.[3] A61K *31/625*

U.S. Cl. 424—232 5 Claims

1. An anti-inflammatory composition of matter comprising, in additive combination, a mixture of 2-(acetyloxy)benzoic acid and an agent of the formula:



wherein X is oxo or imino and ARYL is 2-thienyl or 3-thienyl in the proportion of the 2-(acetyloxy)benzoic acid to the agent of from 100:1 to 1:100 parts by weight.

4,350,690

STEROID COMPOSITION

Cyrus R. Kumana, Ancaster, Canada, assignor to Cressington Investments Ltd., Hong Kong, Hong Kong

Filed Oct. 27, 1980, Ser. No. 200,872

Int. Cl.[3] A61K *31/56*

U.S. Cl. 424—243 4 Claims

1. The process of alleviating topical disorders of the rectum and distal colon of a patient, which comprises rectally administering to said patient a liquid aqueous suspension containing as active ingredient from about 0.1 mg to about 2 mg of a steroid drug of high topical activity and selected from the group consisting of beclomethasone dipropionate and betamethasone-17-valerate, the total volume of said suspension being from about 50 to about 150 mls.

4,350,691

CERTAIN AZABICYCLOCARBOXAMIDES AND COMPOSITIONS CONTAINING SAME

Michael S. Hadley, Sawbridgeworth, and Frank E. Blaney, London, both of England, assignors to Beecham Group Limited, England

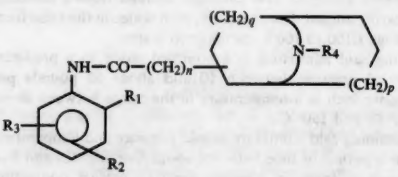
Filed Dec. 5, 1980, Ser. No. 213,237

Claims priority, application United Kingdom, Dec. 20, 1979, 7943985

Int. Cl.[3] C07D *451/04, 451/14;* A61K *31/46, 31/33*

U.S. Cl. 424—244 17 Claims

1. A compound of the formula (III) or a pharmaceutically acceptable salt thereof:



(III)

wherein:

R_1 is a C_{1-6} alkoxy or C_{1-6} alkylthio group;

R_2 is hydrogen, halogen, CF_3, C_{1-7} alkanoyl; C_{1-7} alkanoylamino or amino, aminocarbonyl optionally substituted by one or two C_{1-6} alkoxy, C_{1-6} alkylthio, hydroxy or nitro; or R_1 and R_2 taken together are methylenedioxy or ethylenedioxy

R_3 is hydrogen, halogen, CF_3, C_{1-7} alkanoyl C_{1-7} alkanoylamino or amino, aminocarbonyl or aminosulphonyl optionally substituted by one or two C_{1-6} alkyl groups, C_{1-6} alkylthio, hydroxy or nitro;

R_4 is C_{1-7} alkyl or a group $—(CH_2)_sR_6$ where s is 0 to 2 and R_6 is a C_{3-8} cycloalkyl group, or a group $—(CH_2)_tR_7$ where t is 1 or 2 and R_7 is a phenyl group optionally substituted by one or two substituents selected from C_{1-6} alkyl, C_{1-4} alkoxy, trifluoromethyl and halogen, or a thienyl group; and

n, p and q are independently 0 to 2.

17. A pharmaceutical composition for the treatment or prophylaxis of emesis, which comprises an anti-emetic amount of a compound of the formula (III) as defined in claim 1, or a pharmaceutically acceptable salt thereof together with a pharmaceutically acceptable carrier.

4,350,692

3,7-DISUBSTITUTED-3-CEPHEM-4-CARBOXYLIC ACIDS

Takashi Kamiya, Suita, and Tsutomu Teraji, Toyonaka, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

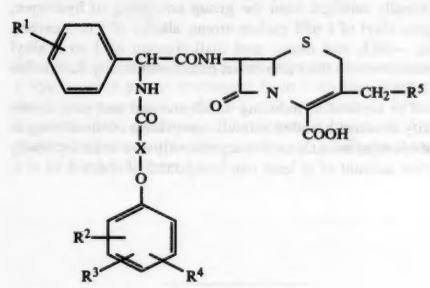
Continuation-in-part of Ser. No. 802,871, Jun. 2, 1977, abandoned, and a continuation-in-part of Ser. No. 802,957, Jun. 2, 1977, abandoned, and a continuation-in-part of Ser. No. 802,976, Jun. 2, 1977, abandoned. This application Jul. 6, 1978, Ser. No. 922,384

Claims priority, application Japan, Jun. 3, 1976, 51/65377; Aug. 19, 1976, 51/99315; Sep. 6, 1976, 51/106887

Int. Cl.[3] A61K *31/545;* C07D *501/54*

U.S. Cl. 424—246 9 Claims

1. A compound of the formula:



(I)

wherein

R^1 is hydrogen or lower alkanesulfonamido,

R^2 is hydroxy, carbamoyl, N-methyl-N-phenylcarbamoyl, amino(lower)alkyl, lower alkoxycarbonylamino(lower)alkyl or benzoyl,

R^3 and R^4 are each, same or different, hydrogen or halogen,

R^5 is lower alkyl tetrazolylthio, and

X is (lower)alkylene,

or the non-toxic pharmaceutically acceptable salt thereof.

9. An antibacterial pharmaceutical composition comprising a therapeutically effective amount of the compound of claim 1 in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,350,693

3,7-DISUBSTITUTED-3-CEPHEM-4-CARBOXYLIC ACID COMPOUND AND PROCESSES FOR THE PREPARATION THEREOF

Takao Takaya, Sakai; Hisashi Takasugi, Kohamanishi; Toshiyuki Chiba, Nara, and Zenzaburo Tozuka, Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

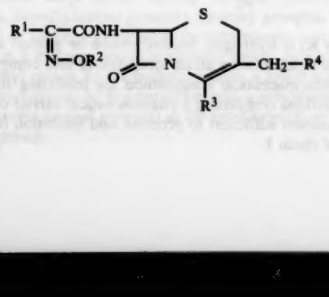
Division of Ser. No. 26,779, Apr. 3, 1979, Pat. No. 4,263,291, which is a continuation-in-part of Ser. No. 839,974, Oct. 6, 1978, abandoned. This application Nov. 12, 1980, Ser. No. 206,299

Claims priority, application United Kingdom, Oct. 8, 1976, 42057/76

Int. Cl.[3] A61K *31/545;* C07D *501/56*

U.S. Cl. 424—246 6 Claims

1. 3,7-Disubstituted-3-cephem-4-carboxylic acid (syn isomer) compound of the formula:



wherein

R^1 is 1,2,3-thiadiazolyl;

R^2 is lower alkyl;

R^3 is carboxy or protected carboxy; and

R^4 is thiadiazolylthio; and

pharmaceutically acceptable salts thereof.

6. An antibacterial composition comprising an effective amount of a compound of claim 1 in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,350,694

CEPHALOSPORIN ANALOGUES AND ANTIMICROBIAL COMPOSITIONS

Misashi Hashimoto, Takarazuka; Keiji Hemmi, Kyoto; Matsuhiko Aratari, Osaka; Hidekazu Takeno, Nara, and Daijiro Hagiwara, Moriguchi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

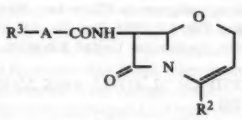
Division of Ser. No. 972,382, Dec. 22, 1978, Pat. No. 4,234,724. This application Mar. 27, 1980, Ser. No. 134,346

Claims priority, application United Kingdom, Dec. 23, 1977, 53735/77; Jun. 16, 1978, 27116/78

Int. Cl.[3] A61K *31/535;* C07D *265/12*

U.S. Cl. 424—248.54 4 Claims

1. The syn isomer of a compound of the formula:



wherein R^3 is furyl;

A is lower alkoxyiminomethylene;

R^2 is carboxy; and pharmaceutically acceptable salts thereof.

4. A antimicrobial composition comprising an effective amount of a compound of claim 1 or pharmaceutically acceptable salt thereof in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,350,695

ANTIHISTAMINIC AND BRONCHOSPASMOLYTIC TRIAZOLOQUINAZOLINONES

Robert Westwood, Faringdon; Wilfred R. Tully, Cirencester, and Robert Murdoch, Highworth, all of Great Britain, assignors to Roussel Uclaf, Paris, France

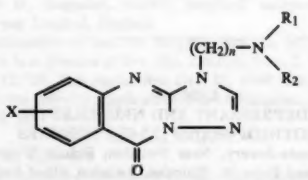
Filed Feb. 13, 1981, Ser. No. 234,544

Claims priority, application United Kingdom, Feb. 14, 1980, 8005089

Int. Cl.[3] A61K *31/505;* C07D *487/04*

U.S. Cl. 424—251 23 Claims

1. A compound selected from the group consisting of triazoloquinazolinones of the formula



I

wherein X is selected from the group consisting of hydrogen, halogen, $—NO_2$, methyl, methoxy and $—CF_3$, n is an integer from 2 to 5, R_1 and R_2 are individually selected from the group consisting of hydrogen and alkyl and hydroxyalkyl of 1 to 5 carbon atoms and taken together with the nitrogen atom to which they are attached form a saturated heterocycle selected from the groups consisting of pyrrolidine, piperidino, morpho-

lino and piperazino optionally substituted with at least one member of the group consisting of hydroxy, alkoxy and hydroxyalkyl of 1 to 5 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, acyl of an aliphatic carboxylic acid of 1 to 5 carbon atoms, alkoxycarbonyl of 2 to 6 carbon atoms and phenyl optionally substituted with a halogen or $-CF_3$ and their non-toxic, pharmaceutically acceptable acid addition salts.

10. An antihistaminic and bronchospasmolytic composition comprising an antihistaminically and bronchospasmolytically effective amount of at least one compound of claim **1** and an inert pharmaceutical carrier.

17. A method of treating asthma, bronchitis and allergic disorders in warm-blooded animals comprising administering to warm-blooded animals an amount of at least one compound of claim **1** sufficient to treat asthma, bronchitis and allergic disorders.

4,350,696

IMIDAZOLE DERIVATIVES, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS THEREOF

Peter E. Cross, Canterbury, and Roger P. Dickinson, Dover, both of England, assignors to Pfizer Inc., New York, N.Y.

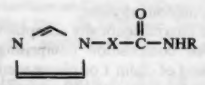
Filed Feb. 17, 1981, Ser. No. 235,330

Claims priority, application United Kingdom, Mar. 8, 1980, 8008084

Int. Cl.[3] **C07D** *403/12, 417/12;* **A61K** *31/505, 31/415*

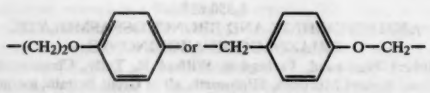
U.S. Cl. 424—251 **10 Claims**

1. A compound of the general formula:



(I)

wherein X is a group of the formula:



and R is a 2-thiazolyl, 2-pyridyl, 2-pyrimidinyl or 5-tetrazolyl group, and the pharmaceutically acceptable acid addition salts thereof.

9. A pharmaceutical composition for use as an inhibitor of thromboxane synthetase enzyme, comprising an effective amount of a compound of claim **1** or a pharmaceutically acceptable acid addition salt thereof together with a pharmaceutically acceptable diluent or carrier.

4,350,697

ANTIDEPRESSANT AND NEUROLEPTIC BENZOTHIOPYRANO [2,3-C]-PYRIDINES

Stephen Clements-Jewery, Near Swindon; Robert Westwood, Faringdon, and Peter W. Hairsine, Swindon, all of England, assignors to Roussel Uclaf, Paris, France

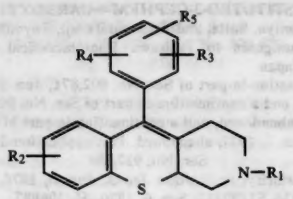
Filed Mar. 4, 1981, Ser. No. 240,392

Claims priority, application United Kingdom, Mar. 6, 1980, 8007660

Int. Cl.[3] **A61K** *31/445;* **C07D** *495/04*

U.S. Cl. 424—256 **21 Claims**

1. A compound selected from the group consisting of compounds of the formula



wherein R_1 is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, R_2 is selected from the group consisting of hydrogen, halogen and methyl, R_3, R_4 and R_5 are individually selected from the group consisting of hydrogen, halogen, alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 3 carbon atoms, $-NH_2$ and mono- and dialkylamino of 1 to 3 alkyl carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

15. The method of inducing antidepressant and neuroleptic acitivity in warm-blooded animals comprising administering to warm-blooded animals an antidepressantly and neuroleptically effective amount of at least one compound of claim **1**.

4,350,698

ANTIALLERGIC IMIDOSULFAMIDES

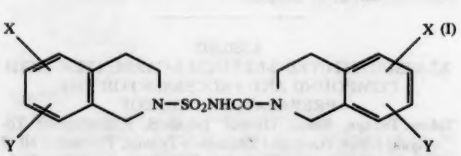
John G. Gleason, Delran, N.J., and David T. Hill, North Wales, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Sep. 25, 1981, Ser. No. 305,433

Int. Cl.[3] **A61K** *31/47;* **C07D** *401/12*

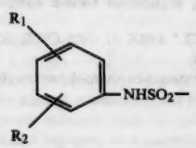
U.S. Cl. 424—258 **13 Claims**

1. A compound of the formula (I)



(I)

wherein X is hydrogen, bromo, chloro, or methyl; and Y is bromo, chloro, methyl or 7-benzeneaminosulfonyl radical of the formula



in which R_1 is hydrogen, bromo, chloro or methyl and R_2 is bromo or chloro; or an alkali metal salt of said compound.

9. A pharmaceutical composition for inhibiting the symptoms of asthma comprising a pharmaceutical carrier or diluent and an amount sufficient to produce said inhibition of a compound of claim **1**.

4,350,699

PYRIDYLALKOXYSULFINYL DERIVATIVES OF CARBAMATE ESTERS

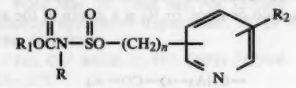
Mohamed A. H. Fahmy, Princeton, N.J.; Tetsuo R. Fukuto, Riverside, Calif., and Teruomi Jojima, Sagamihara, Japan, assignors to The Regents of the University of California, Los Angeles, Calif.

Filed Mar. 30, 1981, Ser. No. 248,820

Int. Cl.³ C07D *213/54, 213/55, 213/56;* A01N *43/40*

U.S. Cl. 424—263 34 Claims

1. A carbamate ester having pesticidal activity selected from the group represented by the formula:



wherein R is methyl; R_1 is selected from the class consisting of a hydrocarbyl group containing from 1 to 20 carbon atoms, and a group containing the >C═N— radical; R_2 is selected from the class consisting of hydrogen; a lower alkyl group containing from 1 to 4 carbon atoms, and a halogen atom, and n is an integer of from 1 to 5.

4,350,700

PHARMACEUTICAL COMPOSITION CONTAINING 1,3,5-SUBSTITUTED BIURET COMPOUND

Hajime Fujimura, Kyoto; Yasuzo Hiramatsu, Otsu; Takahiro Yabuuchi, Takarazuka; Masakatu Hisaki, Hikone; Katsuo Takikawa, Naruto; Takaji Honna, Tokushima; Hidekazu Miyake, Tokushima, and Makoto Kajitani, Tokushima, all of Japan, assignors to Taiho Pharmaceutical Company, Limited, Tokyo, Japan

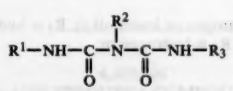
Division of Ser. No. 134,411, Mar. 27, 1980. This application Apr. 27, 1981, Ser. No. 257,583

Claims priority, application Japan, Mar. 31, 1979, 54/38791; Mar. 31, 1979, 54/38793

Int. Cl.³ A61K *31/44*

U.S. Cl. 424—263 7 Claims

1. A method of treating a patient requiring analgesia, said method comprising administering to said patient an analgesic amount of a compound of the formula (1):



(1)

wherein R^1 is a hydrogen atom, a lower alkyl group, a substituted lower alkyl group having chlorine atom(s), cyano group(s), dimethylamino group(s), hydroxy group(s), methoxy group(s) or carboxy group(s) as the substituents, a lower alkenyl group, a hydroxy group, a methoxy group, an acetyl group or a phenyl group; R^2 is a hydrogen atom, a lower alkyl group or a phenyl group; R^3 is a pyridyl group, a substituted pyridyl group having methyl group(s) as the substituent(s) or a pyridyl methyl group.

4,350,701

1-(TRIHALOMETHYL-SULFENYL)-4-ARYL-1,2,4-TRIAZOLIN-5-ONES, AND PROCESS FOR CONTROLLING FUNGI

Costin Rentzea, Heidelberg; Bernd Zeeh, Ludwigshafen; Ernst-Heinrich Pommer, Limburgerhof, and Celia J. Mappes, Westheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

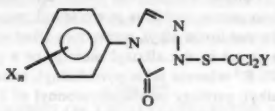
Filed Apr. 6, 1981, Ser. No. 251,125

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1980, 3015090

Int. Cl.³ A01N *43/64, 47/04;* C07D *249/12*

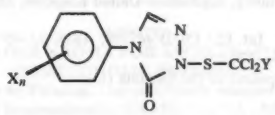
U.S. Cl. 424—269 3 Claims

1. A 1-(trihalomethyl-sulfenyl)-4-aryl-1,2,4-triazolin-5-one of the general formula



where X is hydrogen, halogen, alkyl or alkoxy of 1 to 5 carbon atoms which are unsubstituted or substituted by fluorine, chlorine or bromine, alkenyl of 2 to 4 carbon atoms, cyano or nitro, or phenyl or phenoxy which are unsubstituted or substituted by fluorine, chlorine, bromine or alkyl of 1 to 4 carbon atoms, n is an integer from 1 to 5 and Y is fluorine or chlorine.

2. A method for controlling fungi, wherein the fungus or the object to be protected from fungal attack is treated with a 1-(trihalomethyl-sulfenyl)-4-aryl-1,2,4-triazolin-5-one of the general formula



where X is hydrogen, halogen, alkyl or alkoxy of 1 to 5 carbon atoms which are unsubstituted or substituted by fluorine, chlorine or bromine, alkenyl of 2 to 4 carbon atoms, cyano or nitro, or phenyl or phenoxy which are unsubstituted or substituted by fluorine, chlorine, bromine or alkyl of 1 to 4 carbon atoms, n is an integer from 1 to 5 and Y is fluorine or chlorine.

4,350,702

METHOD OF INHIBITING PLATELET AGGREGATION

Keith H. Baggaley, Redhill, England, assignor to Beecham Group Limited, England

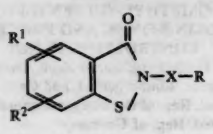
Continuation of Ser. No. 850,788, Nov. 11, 1977, abandoned, which is a division of Ser. No. 738,000, Nov. 2, 1976, Pat. No. 4,113,728. This application Oct. 31, 1980, Ser. No. 202,711

Claims priority, application United Kingdom, Nov. 18, 1975, 47373/75

Int. Cl.³ A61K *31/425*

U.S. Cl. 424—270 19 Claims

1. A method of inhibiting platelet aggregation in humans and animals, of inhibiting thromboses in humans and animals and for treating arterial thromboses in humans and animals which comprises administering to a human or animal in need thereof, in an amount sufficient to inhibit platelet aggregation, an amount sufficient to inhibit the formation of thrombs or an amount sufficient to dissolve thromboses, a compound of the formula



or a pharmaceutically acceptable non-toxic acid addition salt thereof when there is a basic nitrogen atom in the molecule, wherein R^1 and R^2 are the same or different and each is hydrogen, lower alkyl, lower alkoxy, halo-lower alkyl, nitro, amino, acetylamino or halogen; or R^1 together with R^2 when attached to adjacent carbon atoms form an alkylene moiety of 3 to 6 carbon atoms or an oxyalkyleneoxy moiety of 1 to 3 carbon atoms; X is a bond or a straight or branched chain alkylene of 1 to 12 carbon atoms; and R is pyrrolidinyl, unsubstituted or substituted by one lower alkyl, carboxy or alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxyl moiety, or a group of the formula—$NH.R^3$ wherein R^3 is pyrrolidinyl, unsubstituted or substituted by one lower alkyl, carboxy or alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxyl moiety, provided that R^1 and R^2 are not hydrogen or lower alkyl when X is alkylene of two carbon atoms and R is unsubstituted pyrrolidinyl.

4,350,703

β-LACTAM ANTIBACTERIAL AGENTS

Kay H. Dickinson, Reading; Terence C. Smale, Epsom Downs, and Robert Southgate, Warnham, all of England, assignors to Beecham Group Limited, England

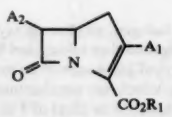
Division of Ser. No. 82,427, Oct. 5, 1979, abandoned, which is a division of Ser. No. 887,844, Mar. 17, 1978, abandoned. This application Jan. 5, 1981, Ser. No. 222,282

Claims priority, application United Kingdom, Mar. 19, 1977, 11747/77

Int. Cl.³ C07D *487/04;* A61K *37/40*

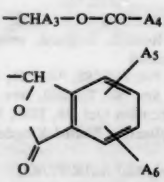
U.S. Cl. 424—274 **20 Claims**

1. A compound of the formula (II):



(II)

wherein R_1 is alkyl of up to 12 carbon atoms, alkenyl of up to 8 carbon atoms, phenyl, benzyl or said alkyl, alkenyl, phenyl or benzyl mono-substituted by lower alkoxyl, lower alkanoyloxyl, halo or nitro; or R_1 is a group of the sub-formula (a) or (b):

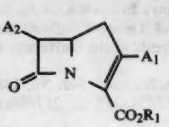


(a)

(b)

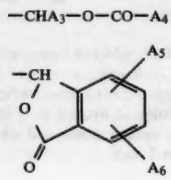
wherein A_3 is hydrogen or methyl; A_4 is lower alkyl, lower alkoxyl, phenyl, phenoxyl, benzyl or benzyloxyl; A_5 is hydrogen, methyl or methoxyl; and A_6 is hydrogen, methyl or methoxyl; A_1 is hydrogen; and A_2 is a group $CR_2R_3R_4$ wherein R_2 is hydrogen or hydroxyl; and R_4 is joined to R_3 to form part of a 5- to 7- carbon atom carbocyclic ring.

11. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises an antibacterially effective amount of a compound of the formula (II):



(II)

wherein R_1 is alkyl of up to 12 carbon atoms, alkenyl of up to 8 carbon atoms, phenyl, benzyl or said alkyl, alkenyl, phenyl or benzyl mono-substituted by lower alkoxyl, lower alkanoyloxyl, halo or nitro; or R_1 is a group of the sub-formula (a) or (b):



(a)

(b)

wherein A_3 is hydrogen or methyl; A_4 is lower alkyl, lower alkoxyl, phenyl, phenoxyl, benzyl or benzyloxyl; A_5 is hydrogen, methyl or methoxyl; and A_6 is hydrogen, methyl or methoxyl; A_1 is hydrogen; and A_2 is a group $CR_2R_3R_4$ wherein R_2 is hydrogen or hydroxyl; and R_4 is joined to R_3 to form part of a 5- to 7-carbon atom carbocyclic ring, in combination with a pharmaceutically acceptable carrier.

4,350,704

SUBSTITUTED ACYL DERIVATIVES OF OCTAHYDRO-1H-INDOLE-2-CARBOXYLIC ACIDS

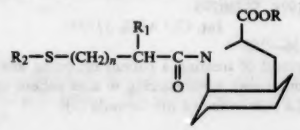
Milton L. Hoefle, and George Bobowski, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 194,307, Oct. 6, 1980, abandoned, which is a continuation-in-part of Ser. No. 137,106, Apr. 2, 1980, abandoned. This application Feb. 17, 1981, Ser. No. 233,940

Int. Cl.³ A61K *31/405;* C07D *209/34*

U.S. Cl. 424—274 **12 Claims**

1. A octahydro-1-(ω-mercaptoalkanoyl)-1H-indole-2-carboxylic acid compound having the formula



wherein R is hydrogen or lower alkyl; R_1 is hydrogen, lower alkyl, or benzyl; R_2 is hydrogen or

where R_3 is lower alkyl, phenyl, substituted phenyl having 1 or 2 substituents selected from the group consisting of fluorine, chlorine, bromine, lower alkyl or alkoxy; and n is 0 or 1; wherein lower alkyl and lower alkoxy include straight or branched groups having 1 to 4 carbon atoms and pharmaceutically acceptable salts of the compounds when R is hydrogen.

12. A method of treating hypertension by administering an

effective amount of a substituted octahydro-1-(3-mercaptoalkanoyl)-1-indole-2-carboxylic acid compound according to claim 1 or a pharmaceutically acceptable salt thereof.

4,350,705

CYCLOHEXANE DERIVATIVES, PROCESS FOR PREPARATION THEREOF AND MEDICINES CONTAINING THESE CYCLOHEXANE DERIVATIVES

Sachiyuki Hamano; Shinichi Kitamura, both of Tokyo; Toshiji Igarashi, Tokorozawa, and Yoshikage Nakajima, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

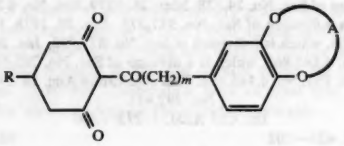
Filed Mar. 25, 1980, Ser. No. 133,694

Claims priority, application Japan, Mar. 31, 1979, 54-37696; Sep. 10, 1979, 54-115240

Int. Cl.³ A61K *31/335;* C07D *317/44*

U.S. Cl. 424—278 21 Claims

1. A compound having the formula:



wherein R is hydrogen, unsubstituted phenyl, furyl or substituted phenyl, in which said substituted phenyl is substituted with from 1 to 5 substituents which are the same or different and are selected from the group consisting of alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, hydroxy, halogen, halogenated alkyl having 1 to 6 carbon atoms, amino, mono-or di-alkyl amino in which the alkyl has 1 to 6 carbon atoms and $—O'(CH_2)_a—O—$ bonded to any two adjacent carbon atoms of the phenyl nucleus and in which "a" is 1 or 2, m is zero or an integer of from 1 to 4, and A is $—(CH_2)_n—$ in which n is an integer of 1 or 2,

in which R_1 and R_2, which can be the same or different, are lower alkyl or phenyl, or $>C=O$, and pharmacologically acceptable salts thereof.

20. A method of treating a subject suffering from hypertension which comprises administering to that subject an antihypertensive effective amount of a compound for the treatment of hypertension as defined in claim 1.

21. A pharmaceutical composition for the treatment of hypertension comprising an antihypertensive amount of a compound as defined in claim 1 mixed with a pharmaceutical carrier.

4,350,706

UREA AND THIOUREA COMPOUNDS AND INSECTICIDAL COMPOSITIONS

Marius S. Brouwer, and Arnoldus C. Grosscurt, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Netherlands

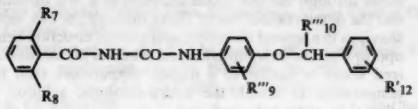
Filed Jun. 27, 1979, Ser. No. 52,371

Claims priority, application Netherlands, Jul. 6, 1978, 7807316

Int. Cl.³ C07C *127/22;* A01N *9/20*

U.S. Cl. 424—322 30 Claims

1. A compound of the formula:



wherein

R_7 and R_8 either are both fluorine or R_7 is a hydrogen atom and R_8 is a chlorine atom or a methyl group;

R_9''' is a hydrogen atom or 1 or 2 methyl groups in the 3- or 3,5-positions with respect to the NH-function;

R_{10}''' is an alkyl group having 1 to 4 carbon atoms, an alkenyl group having 1 to 4 carbon atoms, or trifluoromethyl, and

R_{12}' is a hydrogen atom or a substituent in the 3- and/or 4-position(s) selected from the group consisting of a halogen atom, a methyl group, and a halomethyl group.

4,350,707

INACTIVATION OF LIPID CONTAINING VIRUSES WITH BUTYLATED HYDROXYTOLUENE

Alec D. Keith, Boalsburg, and Wallace Snipes, Pine Grove Mills, both of Pa., assignors to Research Corporation, New York, N.Y.

Filed Feb. 5, 1976, Ser. No. 655,413

Int. Cl.³ A61K *31/05*

U.S. Cl. 424—346 10 Claims

1. A method for treating a subject having a disease caused by lipid-containing viruses comprising administering to said subject an effective inactivating amount therefor of butylated hydroxytoluene in a non-toxic, pharmaceutically acceptable barrier.

4,350,708

NATURAL OAK AROMA FOR ACCELERATING AGING OF ALCOHOLIC BEVERAGES

Jose I. Ruiz de Palacios, Logrono, Spain, assignor to Sistemas Naturales Internacionales, S.A., Sinatin, S.A., Madrid, Spain

Filed May 7, 1980, Ser. No. 147,360

Claims priority, application Spain, May 18, 1979, 480691

Int. Cl.³ C12G *1/00, 3/00*

U.S. Cl. 426—11 9 Claims

1. A process for the obtention of a natural oak aroma for accelerating the aging process of wines, spirits and liqueurs through solid-liquid extraction which comprises:

A. preparing a first extract by:

a. preparing a hydro-alcoholic solution of ethanol in water which titrates in an alcoholometer between about 45° and about 70°;

b. heating said hydro-alcoholic solution of ethanol in water to a temperature between about 25° C. and about 40° C.;

c. contacting successively first and second batches of oak wood shavings with said heated hydro-alcoholic solution of ethanol in water while maintaining about 0.0 to about 0.5 bar overpressure, thereby producing a first extract from the contact of said hydro-alcoholic solution of ethanol in water with said oak wood shavings;

d. cooling said first extract to about 20° C.;

e. gathering the first extract;

B. preparing a second extract by;

a. heating demineralized water to about 30° C. to about 95° C.;

b. contacting successively said second and first batches of oak wood shavings with said heated demineralized water thereby producing a second extract from the contact of said demineralized water with said oak wood shavings;

c. cooling said second extract to about 20° C.;

d. gathering the second extract;

C. wherein the hydro-alcoholic solution of ethanol in water flows through the oak wood shavings in a first direction and the demineralized water flows through the oak wood shavings in a second direction, said second direction being opposite to said first direction and wherein the demineralized water is heated to a higher temperature than the temperature to which the hydro-alcoholic solution of ethanol in water is heated; and

D. combining said first extract with said second extract in such proportions as to obtain an extract mixture which titrates in an alcoholometer between about 30° and about 50°.

4,350,709

GASEOUS ANTI-MICROBIAL TREATMENTS OF STORAGE GRAIN

Frederick D. Vidal, Englewood Cliffs, and Anantharaman Jayaraman, Nutley, both of N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 156,501, Jun. 4, 1980, Pat. No. 4,309,451, which is a division of Ser. No. 50,162, Jun. 20, 1979, abandoned, and a continuation-in-part of Ser. No. 38,739, May 14, 1979, abandoned. This application Jun. 26, 1980, Ser. No. 163,410

Int. Cl.³ A23B *9/00*; A23L *3/34*

U.S. Cl. 426—319 **5 Claims**

1. A method of treating moist grain to produce a preserved grain end product comprising contacting said grain with effective amounts of sulfur dioxide and a lower aliphatic fatty acid vapor to produce a preserved grain product wherein the amount of said vapor is sufficient to enhance the antimicrobial actions of said sulfur dioxide.

4,350,710

METHOD AND AN APPARATUS FOR THE MANUFACTURE OF BAKED PRODUCTS, ESPECIALLY BREAD

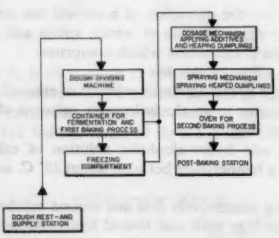
Erich Sundermann, Brunswick, Fed. Rep. of Germany, assignor to Perfluktiv-Consult AG, Zurich, Switzerland

Filed Feb. 8, 1980, Ser. No. 119,829

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1979, 2905284

Int. Cl.³ A21D *8/02*

U.S. Cl. 426—19 **27 Claims**


DOUGH DIVIDING MACHINE
DOSAGE MECHANISM APPLYING ADDITIVES AND HEAPING DUMPLINGS
SPRAYING MECHANISM SPRAYING HEAPED DUMPLINGS
CONTAINER FOR FERMENTATION AND FIRST BAKING PROCESS
OVEN FOR SECOND BAKING PROCESS
FREEZING COMPARTMENT
POST-BAKING STATION
DOUGH REST- AND SUPPLY STATION

1. A method of manufacturing a baked final product, comprising the steps of:

mixing flour, additives, and water into a dough;

allowing the dough to rest;

dividing and shaping the dough into separate dumplings, each dumpling having a volume small compared to the volume of the final product;

introducing the dumplings in one layer into molding troughs;

exposing the dumplings in the troughs to flowing gaseous and/or vaporous thermal media in a fermentation room;

subjecting the separate dumplings to a first baking process until they have reached a state of form stability with a thin skin-like coating being formed or a crust beginning to develop;

arranging subsequently the thus treated dumplings into a bulky heap in which the dumplings are piled on top of each other, whereby there will be defined gaps between the dumplings forming interspaces for gases to flow therethrough; and

thereafter, in a second baking process passing hot gases and/or vapor through the interspaces of the bulky heap until the dumplings are baked to one another and the gaps formed between the dumplings are partially or fully filled and wherein the bulky heap is subjected to the second baking process for a time sufficient to complete crust formation, whereby the dumplings will be extended to have a substantially uniform structure throughout the entire cross-section of the final product.

4,350,711

METHODS OF INFUSING FRUITS

Marvin L. Kahn, Williamsville, and Kuttikandathil E. Eapen, West Seneca, both of N.Y., assignors to Rich Products Corporation, Buffalo, N.Y.

Continuation-in-part of Ser. No. 152,050, May 21, 1980, which is a division of Ser. No. 24,128, Mar. 26, 1979, Pat. No. 4,234,611, which is a division of Ser. No. 917,379, Jun. 20, 1978, Pat. No. 4,199,604, which is a division of Ser. No. 871,995, Jan. 24, 1978, Pat. No. 4,145,863, which is a division of Ser. No. 763,613, Jan. 28, 1978, Pat. No. 4,146,652. This application Aug. 13, 1981, Ser. No. 292,411

Int. Cl.³ A23L *1/212, 1/06*

U.S. Cl. 426—102 **62 Claims**

1. A method of infusing fruits capable of undergoing osmotic exchange with sugar solids comprising:

a. bathing a fruit in a first sugar containing bath wherein said sugar component of said bath is comprised of about 35 to about 100% by weight fructose, wherein the water soluble solids content of said fruit is increased by the infusion of sugar solids from the bath into the fruit, and

b. separating the infused fruit from said first bath, and

c. bathing said infused fruit in at least one more sugar containing bath wherein said sugar component of said bath is comprised of about 35 to about 100% by weight fructose to further increase the water soluble solids content of said infused fruit product to about 32 to about 55% by weight, wherein the increase in said water soluble solids content of said fruit after treatment in said first bath and the increase in said water soluble solids content of said fruit after treatment in said at least one more bath are adjusted to provide an infused fruit product having a volume which is at least about 62% of the volume of said fruit prior to being infused with said sugar solids.

4,350,712

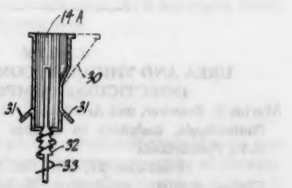
FROZEN BEVERAGE STICK INCLUDING RETRACTABLE CUP

Alfred Kocharian, c/o George Spector 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of NY, N.Y. 10007

Filed Feb. 10, 1981, Ser. No. 233,153

Int. Cl.³ B65D *83/00, 85/72*

U.S. Cl. 426—134 **1 Claim**



1. A frozen beverage stick, comprising in combination a

liquor frozen into a solid bar upon one end of a flat stick, a cup shaped shield around said solid, said shield having a hole in a flexible bottom thereof through which said stick extends, said hole in said flexible bottom of said shield corresponding in shape to the cross-section of said stick, said stick including means for retracting and retaining the shield in a plurality of sealed positions exposing sides of said solid bar in order that it may be consumed progressively wherein said means for retracting comprise said shield being slidable on said stick against one end of a compression coil spring around said stick, said compression coil spring being positioned on said flat stick and being shaped to fit around the flat stick and having one end of the spring bearing against said flexible bottom of said shield and the other end of the spring secured to said flat stick, said shield including grooves along its inner surface to facilitate drinking the beverage when melted and to facilitate retracting the shield and wherein said means for retaining comprise successive wedges on said stick below said hole providing spaced shoulders to retain the shield in various retracted positions said spring being coiled about said wedges such that said flexible bottom is abutted by said coils sealingly against said shoulders in said retracted positions to firmly bear against said shoulders preventing downward slippage and leakage, further including an enlarged opening at the top of said shield for drinking purposes, in further combination with external tabs on said shield for manually forcing the shield downward.

4,350,713

PRODUCTION OF SPONGE CAKE

David V. Dyson, Richmond Hill; David H. Lees, Bolton; Michael A. F. Fenn, Ajax, and Kenneth S. Darley, Whitby, all of Canada, assignors to The Griffith Laboratories, Limited, Scarborough, Canada

Filed Mar. 16, 1981, Ser. No. 244,247

Int. Cl.³ A21D *8/00*

U.S. Cl. 426—243 **16 Claims**

1. A continuous process for manufacture of sponge cake, which comprises:

feeding cake-forming components including flour, sugar, egg and water to a continuous mixing zone in quantities such that the total quantity of moisture in the cake-forming components is about 20 to about 45% by weight,

advancing the cake-forming components in plug flow manner through said mixing zone in about 20 to about 180 seconds,

subjecting said cake-forming components to conditions of shear within said mixing zone such that the work done on the materials within the mixing zone varies from about 4 to about 7 watt hr/lb. of cake-forming components to cause mixing of said components,

subjecting said cake-forming components to a back pressure within said mixing zone of about 10 to about 75 psig,

extruding from said mixing zone a cake-forming batter mix of density from about 0.65 to about 0.95 g/cc,

substantially immediately after said extrusion, baking said extruded batter mix in a microwave baking zone using microwave radiation at an input of about 3 to about 12 kw min/lb. of batter while passing air through said zone to remove generated steam, and

maintaining said batter in said zone for a time sufficient to result in a baked sponge cake having an internal temperature of about 180° to about 230° F. and to effect a loss of moisture of about 10 to about 23 wt.%.

4,350,714

CORN BRAN EXPANDED CEREAL

Leroy F. Duvall, Crystal Lake, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Continuation of Ser. No. 62,934, Aug. 2, 1979, abandoned. This application Apr. 21, 1981, Ser. No. 256,226

Int. Cl.³ A23L *1/10, 1/18*

U.S. Cl. 426—559 **10 Claims**

1. A process for producing a dry ready to eat high fiber cereal product comprising the steps:

admixing with cereal dough ingredients sufficient ground corn bran, as an ingredient to provide fiber content of 3.5 to 10 percent by weight, inclusive, based on the weight of the product, said corn bran having been ground to a fineness whereby 100 percent of said corn bran passes through a 40 mesh U.S. sieve, cooking the ingredients in a cooker-extruder to form an extrudate under temperature and pressure conditions sufficiently high to result in expansion of the dough upon its release from the cooker-extruder, cutting the expanded dough extrudate into discrete pieces, and drying the resulting pieces to a moisture level to 2–3 percent.

4,350,715

PLASTIC FAT BASED MATERIAL AND PRODUCTS THEREFROM

Johannes H. M. Rek, Vlaardingen, Netherlands, assignor to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Filed Jan. 13, 1981, Ser. No. 224,824

Claims priority, application Netherlands, Jan. 16, 1980, 8000258

Int. Cl.³ A23D *3/00, 5/00;* A23C *13/12*

U.S. Cl. 426—570 **11 Claims**

1. An edible plastic fat-based composition at least 80 wt % of which comprises a fatty phase consisting of at least 50 wt % butterfat and at least 10 wt % of at least one fat selected from the group consisting of shea stearin and unhardened palm kernel fat, the solid fat content of the fatty phase, based on the total fat present, being at least 15 wt % at 20° C.

4,350,716

PROCESS FOR THE PRODUCTION OF A FINE GRAINED MULTIPLE LACTATE AND ITS USE AS A BAKING AGENT

Lothar Belohlawek, Freising, and Wolfgang Weber, Munich, both of Fed. Rep. of Germany, assignors to Dimalt Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 13, 1979, Ser. No. 103,419

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1978, 2854291

Int. Cl.³ A21D *2/14*

U.S. Cl. 426—626 **8 Claims**

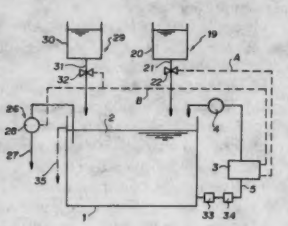
1. In a process for preparing a lactate concentrate in which 2–6 weight percent of a basic calcium compound is mixed with 30–55 weight percent of a cereal product, the mixture is then contacted with 15–40 weight percent of lactic acid and the resultant combination is allowed to react for the desired period of time to form a reaction product, the improvement which comprises adding to the reaction product, 2–10 weight percent of $CaSO_4.\frac{1}{2}H_2O$, all weights being based on the weight of the concentrate, whereby a fine-grained multiple lactate concentrate is obtained.

4,350,717

CONTROLLING ELECTROLESS PLATING BATH

Ken Araki, Ibaragi; Hiromitsu Sakai, Kawanishi, and Yutaka Sugiura, Kobe, all of Japan, assignors to C. Uyemura & Co., Ltd., Osaka, Japan

Filed Nov. 4, 1980, Ser. No. 204,084
Claims priority, application Japan, Dec. 29, 1979, 54-172961
Int. Cl.³ C23C 3/02, 3/00
U.S. Cl. 427—8 16 Claims



1. A method for controlling an electroless plating bath which extends the useful lifetime of the bath, the bath comprising consumable ingredients and nonconsumable ingredients, the method comprising:

a. continuously or intermittently measuring the concentration of at least one consumable ingredient in the bath;

b. automatically adding to the plating bath a first replenishing composition consisting essentially of consumable ingredients after detecting that said concentration has reached a predetermined concentration value;

c. measuring the consumption of at least one consumable ingredient of the plating bath to determine the degree of aging of the bath;

d. detecting when said consumption has reached a predetermined consumption value;

e. when said consumption has reached said predetermined consumption value, automatically discharging a predetermined voltage of the plating solution; and

f. automatically adding to the bath a second replenishing solution containing nonconsumable ingredients in an amount essentially corresponding to the amount lost by the discharging of step (e).

4,350,718

METHOD OF FABRICATING GRAPHITE TUBE

Bernhard Huber, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co. GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 245,790, Mar. 20, 1981, abandoned. This application Sep. 21, 1981, Ser. No. 304,518
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1980, 3010717
Int. Cl.³ B05D 7/22, 3/02
U.S. Cl. 427—181 10 Claims

1. Method of coating a graphite tube, said method comprising the steps of:

forming a layer of adhesive, volatile material on said graphite tube;

applying a powder of inert material to said layer;

pyrolyzing, in the presence of an inert gas flow, said layer; and thereafter

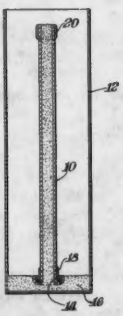
coating said graphite tube with pyrolytic graphite.

4,350,719

DIFFUSION COATING AND PRODUCTS THEREFROM

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 73,539, Sep. 7, 1979, Pat. No. 4,260,654, Ser. No. 851,504, Nov. 14, 1977, and Ser. No. 809,189, Jun. 23, 1977, Pat. No. 4,308,160, said Ser. No. 73,539, is a continuation-in-part of Ser. No. 953,762, Oct. 23, 1978, Pat. No. 4,241,147, said Ser. No. 73,539, Ser. No. 851,504, Ser. No. 809,189, and Ser. No. 953,762, each is a continuation-in-part of Ser. No. 752,855, Dec. 21, 1976, Pat. No. 4,208,453, Ser. No. 694,951, Jun. 11, 1976, abandoned, and Ser. No. 614,834, Sep. 19, 1975, Pat. No. 4,141,760, which is a continuation-in-part of Ser. No. 579,945, May 22, 1975, abandoned, Ser. No. 466,908, May 31, 1974, Pat. No. 3,958,047, Ser. No. 446,473, Feb. 27, 1974, Pat. No. 3,958,046, Ser. No. 404,665, Oct. 9, 1973, Pat. No. 3,948,689, Ser. No. 357,616, May 7, 1973, Pat. No. 3,948,687, and Ser. No. 304,220, Nov. 6, 1972, Pat. No. 3,936,539, said Ser. No. 752,855, is a continuation-in-part of Ser. No. 694,951, , which is a continuation-in-part of Ser. No. 614,834, , and Ser. No. 579,945, , said Ser. No. 752,855, is a continuation-in-part of Ser. No. 614,834, , and Ser. No. 579,945, , said Ser. No. 446,473, Ser. No. 404,665, Ser. No. 357,616, and Ser. No. 304,220, each is a continuation-in-part of Ser. No. 254,403, May 18, 1972, Pat. No. 3,785,854, Ser. No. 90,682, Nov. 18, 1970, Pat. No. 3,764,371, and Ser. No. 219,514, Jan. 20, 1972, Pat. No. 3,801,357, which is a continuation-in-part of Ser. No. 837,811, Jun. 30, 1969, said Ser. No. 254,403, is a continuation-in-part of Ser. No. 219,514, , and Ser. No. 90,682, , which is a continuation-in-part of Ser. No. 219,514, , and Ser. No. 837,811, , said Ser. No. 466,908, and Ser. No. 446,473, each is a continuation-in-part of Ser. No. 404,665, , Ser. No. 357,616, , and Ser. No. 304,220, , said Ser. No. 404,665, is a continuation-in-part of Ser. No. 357,616, , and Ser. No. 304,220, , said Ser. No. 357,616, is a continuation-in-part of Ser. No. 304,220,. This application Feb. 26, 1981, Ser. No. 238,500
Int. Cl.³ C23C 11/04, 9/02
U.S. Cl. 427—253 3 Claims

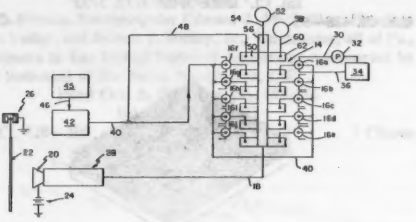


1. The process of diffusion coating a workpiece with chromium and then with aluminum, which process is characterized by loading the workpiece in a diffusion coating retort, then subjecting the retort to a diffusion-coating heat while introducing into it a chromizing vapor to cause the vapor to contact and chromize the workpiece, then without removing the workpiece, introducing into the retort an aluminizing powder pack to cause it to contact the workpiece, and then bringing the retort to diffusion aluminizing temperature to cause the chromized workpiece to be aluminized by said pack before the workpiece is removed from the retort.

4,350,720
UNCONTAMINATED PURGE SOLVENT RECOVERY SYSTEM

James A. Scharfenberger, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Continuation-in-part of Ser. No. 228,166, Jan. 26, 1981, Pat. No. 4,311,724, and Ser. No. 275,872, Jun. 22, 1981. This application Nov. 30, 1981, Ser. No. 326,151
Int. Cl.³ B05D *7/14, 1/02*
U.S. Cl. 427—401 5 Claims

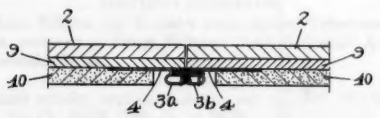


1. In a process for terminating the flow of a coating material in a coating material delivery system which delivers the coating material to a dispensing device from which the material is dispensed during a coating operation and from which flow of the material ceases at the end of the coating operation, the process including the steps of terminating the flow of coating material to the dispensing device, initiating the flow of a fluid cleaning medium to the dispensing device, terminating the flow of cleaning medium, and establishing a partial vacuum on the remaining cleaning medium.

4,350,721
COLLAPSIBLE INDOOR SPORTS MATS

Jiro Nagase, Tokyo, Japan, assignor to Nagase Rubber Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1981, Ser. No. 322,222
Int. Cl.³ D04H *11/00*
U.S. Cl. 428—33 3 Claims



1. In collapsible indoor sports mats in which a plurality of unit mats can be connected to and separated from one another by means of fasteners, the improvement wherein tapes of said fasteners having engaging teeth aligned thereon are fixed on the backs of said unit mats at their connecting edges, non-toothed portions for guiding a slider formed by removing said engaging teeth are formed at the ends of parts

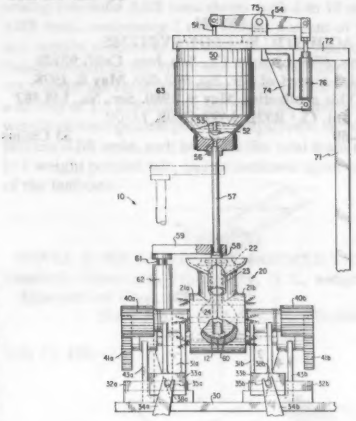
extending from said unit mats and location reference line marks are put at the corresponding positions on the surface of said extending parts opposing one another so that court lines on said unit mats to be connected are automatically matched with one another.

3. The combination as recited in claim 1 wherein linings are adhered to said unit mats and elastic plates of sponge materials are also adhered to said linings, said elastic plates of sponge materials having enough space to let said slider move freely between themselves.

4,350,722
HOLLOW GLASS ARTICLE WITH IMPROVED OPTICAL FINISH

Donald G. Trutner, Chatham, N.J., and Luke Thorington, Easton, Pa., assignors to Duro-Test Corporation, North Bergen, N.J.

Division of Ser. No. 29,310, Apr. 12, 1979, Pat. No. 4,295,873. This application Mar. 9, 1981, Ser. No. 241,646
Int. Cl.³ B65D *1/02*
U.S. Cl. 428—35 4 Claims



1. A hollow glass article of improved optical finish formed by depositing in the original article constrained in a mold through an opening therein a molten liquid material of a temperature sufficient to soften the glass and produce a hydrostatic pressure therein which reforms the original article into the finished article by expanding the original article to the shape of the mold.

4,350,723
PEEL-UP TYPE ADHESIVES

Takaaki Sugimura, Yokohama; Yutaka Ozawa, Tokyo, and Mari Takahashi, Yokohama, all of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 50,130, Jun. 19, 1979, abandoned, which is a continuation of Ser. No. 886,666, Mar. 15, 1978, abandoned, which is a division of Ser. No. 732,195, Oct. 14, 1976, abandoned. This application Jan. 26, 1981, Ser. No. 228,367
Claims priority, application Japan, Oct. 17, 1975, 50-125068
Int. Cl.³ D06N *3/18*
U.S. Cl. 428—42 3 Claims

1. A method of removably bonding an adherend selected from paper, cushioned floor and foam-backed carpet to a substrate composed of concrete, synthetic resin board or wood, which allows the adherend to be removed from the substrate without breakage of the substrate and without adhesive remaining on the substrate, with a peel-up type adhesive which permits the adherend and adhesive to be peeled from the substrate without breakage of the adherend and without any adhesive remaining on the substrate which comprises bonding said adherend to the substrate with a peel-up type adhesive composition having a viscosity of 500 to 5,000 poises and consisting essentially of a rubber latex containing a polymeric substance which is film-forming at room temperature selected from the group consisting of a natural rubber latex, a styrene/butadiene rubber latex, a carboxy-modified styrene/butadiene rubber latex, an acrylonitrile/butadiene rubber latex, a styrene/isoprene rubber latex, a methyl methacrylate/butadiene rubber latex, a styrene/butadiene/methyl methacrylate rubber latex,

an acrylonitrile/butadiene/isoprene rubber latex, and a chloroprene rubber latex, and 20 to 200 parts by weight, per 100 parts by weight of the solid polymeric substance content of the rubber latex, of a fibrous material and 2 to 20 parts by weight, per 100 parts by weight of the solid polymeric substance content of the rubber latex, of a nonionic surface-active agent; and removing said adherend from said substrate by peeling said adherend and adhesive intact from said substrate when it is desired to replace said adherend.

4,350,724

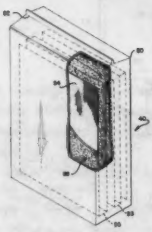
ACOUSTIC ENERGY SYSTEMS

Ralph E. Marrs, 6809 Chateau Ct., San Jose, Calif. 95120

Continuation-in-part of Ser. No. 903,489, May 8, 1978, abandoned. This application May 9, 1980, Ser. No. 148,482

Int. Cl.³ B32B *3/00;* **G10K** *11/00*

U.S. Cl. 428—69 **33 Claims**



1. A volumetric gaseous system having dimensionless volumetric compliance substantially greater than unity in response to compression and expansion of the gas comprising:

spatially distributed matrix means defining a volumetric interaction region and including a distributed mass of fine fibers extending throughout the region, and also including a distributed fluid mass defining thin liquid sheaths on the surfaces of the fibers and also existing throughout the spaces in the fiber mass in the saturated vapor state, the liquid sheaths being in good thermal relationship with the fibers and also in proximity to the vapor molecules in the spaces between the fibers, such that the distributed liquid sheaths and fibers in the system interact responsively to vaporization of molecules during expansion and to condensation of molecules during compression to serve as high surface area heat sinks having a short thermal transport distance to the vapor molecules whereby the volumetric compliance of the region is increased by the interaction.

4,350,725

FABRIC AND GARMENT OF CIRCULAR WEFT-KNIT OR CIRCULAR WARP-KNIT MATERIAL

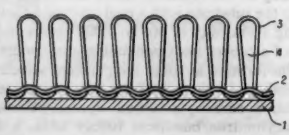
Helmut C. Pflüger, Neumünster, Fed. Rep. of Germany, assignor to Norddeutsche Faserwerke GmbH, Neumünster, Fed. Rep. of Germany

PCT No. PCT/DE80/00161, § 371 Date Jun. 25, 1981, § 102(e) Date Jun. 25, 1981

PCT Filed Oct. 24, 1980, Ser. No. 279,990

Int. Cl.³ B32B *3/02, 33/00*

U.S. Cl. 428—95 **8 Claims**



1. Fabric comprising a web which is circular weft-knit or circular warp-knit from textured synthetic continuous-filament yarn, said web having a polyurethane coating and a polysiloxane elastomer finish.

4,350,726

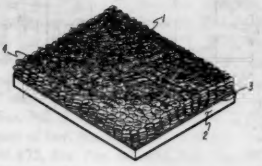
PROTECTIVE PAD FOR BACKPACKS

French J. Berry, Jr., General Delivery, Sandia Park, N. Mex. 87047

Filed Jul. 30, 1981, Ser. No. 288,663

Int. Cl.³ B32B *3/02, 5/18, 5/32*

U.S. Cl. 428—95 **5 Claims**



1. A protective pad for backpacks comprising:

(a) a pile fleece, said fleece consisting of one-half inch thick fibers woven into a cloth backing,

(b) a bonding agent or adhesive,

(c) a spongy, light-weight foam, said foam consisting of an organic material having an open, partially open or closed cell structure and being about three-eighths inch thick,

(d) said fleece is bonded to said foam with fleece side of the pad being placed directly against the skin, and

(e) the total thickness of said pad being approximately one inch.

4,350,727

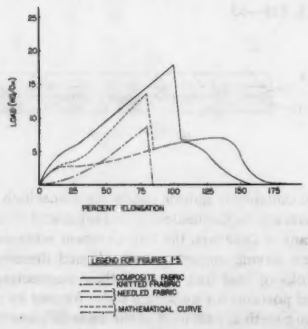
SYNERGISTIC TEXTILE COMPOSITE

Stephen A. Wald, and Robert W. Carter, both of Winston-Salem, N.C., assignors to Lydall, Inc., Manchester, Conn.

Continuation-in-part of Ser. No. 167,216, Jul. 9, 1980, abandoned. This application Sep. 28, 1981, Ser. No. 306,533

Int. Cl.³ B32B *3/06*

U.S. Cl. 428—102 **24 Claims**



1. A textile composite comprising:

(1) a non-woven textile fabric composed of textile fibers needled together into a network of coherently entangled fibers and having an overall bulk density of between 4 and 20 lbs. per cubic foot;

(2) a knitted textile fabric having a weight of between 1 and 8 ozs. per square yard bound to the said needled fabric to form a composite thereof; and

wherein the binding of the said fabrics is such that at least one tensile property of the composite is greater than the

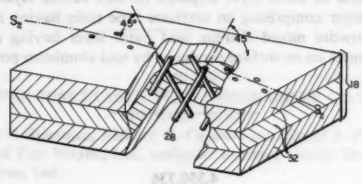
sum of that same property of the said non-woven and knitted fabrics, provided that the said same property is measurable at an extension which is the same or less than the extension at failure of the composite.

4,350,728

CROSS REINFORCEMENT IN A GRAPHITE-EPOXY LAMINATE

Shih L. Huang, Southampton; Edward J. McQuillen, Huntingdon Valley, and Robert J. Richey, Jr., Warminster, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 2, 1980, Ser. No. 193,324
Int. Cl.³ B32B 5/12
U.S. Cl. 428—105 7 Claims



1. A lightweight reinforced composite material for use in structures having high stress applications, comprising:

a plurality of plies of a fibrous resin adhesively bonded together to form a laminate; and

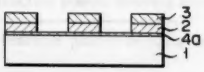
a plurality of reinforcing rods embedded in said laminate to span the distance between the outer surfaces thereof, said rods being positioned in adjacent pairs along measured critically highest stress planes in said laminate, said pairs being parallel to said stress planes on opposite sides thereof and angularly displaced in opposite directions to planes normal to said stress planes.

4,350,729

PATTERNED LAYER ARTICLE AND MANUFACTURING METHOD THEREFOR

Hirotaka Nakano, and Kensaku Yano, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 7, 1980, Ser. No. 166,780
Claims priority, application Japan, Jul. 11, 1979, 54-86882
Int. Cl.³ B32B 3/10, 15/04; B44C 1/22; C23F 1/02
U.S. Cl. 428—209 14 Claims



1. A patterned layer article comprising:

a substrate;

a protective layer formed on the surface of the substrate and resistant to dry etching, said protective layer being selected from the group consisting of yttrium oxide, scandium oxide, neodymium oxide, promethium oxide, samarium oxide, europium oxide, gadolinium oxide, terbium oxide, dysprosium oxide, holmium oxide, erbium, oxide, thulium oxide, ytterbium oxide, and lutetium oxide; and

at least one laminated and patterned layer formed on the surface of the protective layer, and having a larger etching rate than that of said protective layer.

4,350,730

PLASTIC LAMINATE

Stephen J. Cyr; John C. Schubert, both of Chippewa Falls, Wis., and John Dehlinger, Tenants Harbor, Me., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 16, 1981, Ser. No. 311,930
Int. Cl.³ B32B 7/00, 3/26, 25/16
U.S. Cl. 428—215 4 Claims

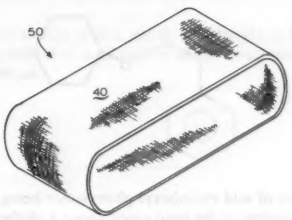
3. A laminate suitable for use as a graphic arts board comprising two solid ABS resin sheets each 2 to 10 mils thick, said ABS resin, comprising 1 to 5 weight percent of pigment, 0.05 to 3 weight percent of a UV stabilizer, said solid sheets being fusion bonded to the upper and lower surfaces of a foam resin core, said foam resin core being 50 to 500 mils thick and having a density of 1.5 to 6 pounds per cubic foot containing 100 to 70 weight percent general purpose polystyrene and 0 to 30 weight percent ABS resin, and, based on the total foam resin core, 0.1 to 1 weight percent talc, and an antistatic agent on the surfaces of the laminate.

4,350,731

NOVEL YARN AND FABRIC FORMED THEREFROM

Elizabeth Siracusano, Schenectady, N.Y., assignor to Albany International Corp., Albany, N.Y.

Filed Jun. 8, 1981, Ser. No. 271,590
Int. Cl.³ B32B 5/06
U.S. Cl. 428—234 7 Claims



4. A composite yarn, which comprises;

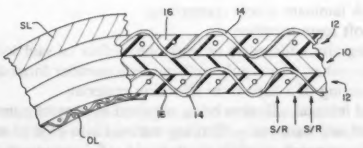
a core yarn selected from the class consisting of high tensile strength non-elastic, monofilament, multifilament and spun yarn, wrapped in a first direction and in a second direction with an elastomeric filament, the lengthwise axis of said wrappings being at an angle non-perpendicular to the lengthwise axis of the core yarn.

4,350,732

REINFORCING LAMINATE

Robert F. Goodwin, Georgetown, Mass., assignor to Foss Manufacturing Company, Inc., Mass.

Continuation of Ser. No. 88,656, Oct. 26, 1976, abandoned. This application Mar. 25, 1981, Ser. No. 247,387
Int. Cl.³ F16G 1/00
U.S. Cl. 428—246 11 Claims



1. A stiff laminate, which is moldable and simultaneously bondable to a substrate surface for purposes of reinforcement or the like, comprising,

at least one layer of tough resin,

at least one solvent- or heat-activatable adhesive impregnated cloth layer,

the layers being bonded to each other at least in part through locking of cloth fiber portions of the latter layer into the adjacent resin layer,

the adhesive impregnant comprising a styrene saturant which is capable of impregnation into the fibrous layer in liquid form and hardenable therein to form a stiff solid layer.

4,350,733

CYCLOHEXYL PHENETHYLETHER AND USES THEREOF IN COMBATTING TOBACCO BEETLES AND IN AUGMENTING OR ENHANCING THE AROMA OF PERFUMES, COLOGNES AND PERFUMED ARTICLES

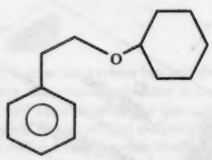
Jacob Kiwala, Brooklyn, N.Y.; Richard J. Tokarzewski, Keyport; Frederick L. Schmitt, Holmdel, and Mark A. Sprecker, Sea Bright, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 192,238, Sep. 30, 1980, Pat. No. 4,306,096. This application May 28, 1981, Ser. No. 267,845

Int. Cl.³ D06M *13/18;* **B32B** *27/12;* **D04H** *11/00*

U.S. Cl. 428—290 **1 Claim**

1. A drier-added fabric softener article comprising a substrate and a coating and intimately admixed with the coating cyclohexyl phenethylether having the structure:



the amount of said cyclohexyl phenylether being sufficient to cause the aroma of the head space above a clothes batch with which the dryer-added fabric softener article is treated to have imparted thereto a floral aroma.

4,350,734

INTEGRAL COMPOSITE FOAM PRODUCT AND METHOD

James A. Hammond, Redlands, Calif., assignor to Colamco, Inc., Columbus, Ohio

Filed Oct. 23, 1980, Ser. No. 199,996

Int. Cl.³ B32B *3/26*

U.S. Cl. 428—308.4 **13 Claims**

1. A laminate article comprising:

a soft foam member;

integrally adhered to at least one surface of said soft foam member, a hard polyurethane resin member formed by the curing of a hard resin affording material;

said integral adhesion being obtained by way of penetration of said hard resin affording material into cells of said soft foam member, while coating said soft foam member, for a distance sufficient to provide a substantially permanent bond between said two members, after curing said hard resin affording material; and

said hard resin member sufficiently thick to provide configurational support of predetermined rigidity for said article.

4,350,735

BLANKET FOR OFFSET PRINTING

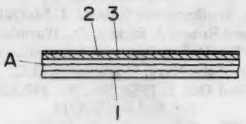
Joichi Saitoh, Hotarugaike-higashi, Japan, assignor to Kotobuki Seihan Printing Co., Ltd., Osaka, Japan

Filed Nov. 3, 1980, Ser. No. 203,506

Claims priority, application Japan, Nov. 22, 1979, 54-151642

Int. Cl.³ B32B *5/16, 3/00*

U.S. Cl. 428—328 **2 Claims**



1. An offset printing blanket comprising a substrate, a rubber layer, and an outer layer disposed on said rubber layer, said outer layer comprising an urethane type resin having aluminum powder mixed therein, said outer layer having a fine unevenness on its surface produced by said aluminum powder.

4,350,736

WEAR AND WATER RESISTANT PLASTER ARTICLES

William S. Reily, Des Plaines, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Jul. 14, 1980, Ser. No. 168,971

Int. Cl.³ B32B *9/06, 3/22*

U.S. Cl. 428—341 **6 Claims**

1. A wear resistant and water repellent plaster article comprising

a formed plaster article having an exterior surface portion thereof coated with a thin layer of Candelilla wax,

said wax solidified to a hard finish,

said wax present in an amount no less than about 0.020 pounds per square foot (0.010 grams per square centimeter),

said wax coating said exterior surface portion and substantially filling exterior pores and irregularities,

said coated surface portion providing a substantially water impregnable barrier and providing enhanced wear resistance,

said coated surface portion having a light yellow to light brown color and capable of being buffed to a lustrous finish,

wherein said wax has a sufficiently high melt point providing a firm surface upon exposure to ambient room temperatures of up to about 130° F. (54° C.).

4,350,737

POWER INSERTABLE NYLON COATED MAGNET WIRE

Hollis S. Saunders; Richard V. Carmer, and Lionel J. Payette, all of Fort Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

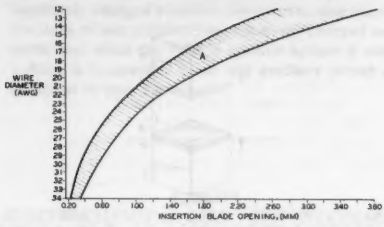
Filed Oct. 19, 1981, Ser. No. 312,599

Int. Cl.³ B32B *27/00;* **H01B** *7/00*

U.S. Cl. 428—383 **12 Claims**

1. A lubricated magnet wire comprising an electrically conducting substrate having an electrically insulating nylon outer coating, and a external lubricant coating on the nylon outer coating comprising a mixture of paraffin wax, hydrogenated triglyceride and an ester lubricant composition comprising esters of fatty alcohols and fatty acids, the ratio, by weight, of

paraffin wax to triglyceride being about 1:15 to 60:1 and the ratio of triglyceride to ester lubricant being about 1:30 to 30:1,



the coated magnet wire capable of power insertion into coil slots in its locking wire size range.

4,350,738

POWER INSERTABLE POLYAMIDE-IMIDE COATED MAGNET WIRE

Hollis S. Saunders; Richard V. Carmer, and Lionel J. Payette, all of Fort Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Oct. 13, 1981, Ser. No. 310,681
Int. Cl.³ B32B *27/00*; H01B *7/00*
U.S. Cl. 428—383 **3 Claims**

1. A lubricated magnet wire comprising an electrically conducting substrate having an electrically insulating polyamide-imide outer coating, and a lubricant coating on the polyamide-imide outer coating comprising oleic acid, beeswax, fluorocarbon surfactant, and paraffin wax, the coated magnet wire capable of multiple winding power insertion into coil slots without damage to the polyamide-imide outer coating.

4,350,739

MOLDED PLASTIC PART

Gulam Mohiuddin, Brighton, Mich., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 61,633, Jul. 30, 1979, abandoned. This application Jun. 25, 1980, Ser. No. 162,682
The portion of the term of this patent subsequent to Aug. 4, 1998, has been disclaimed.
Int. Cl.³ B32B *27/40, 27/36, 27/38*; B29F *1/10*
U.S. Cl. 428—425.1 **17 Claims**

1. A process for producing a molded plastic part comprising

coating the surface of a mold, prior to molding said part, with a coating composition containing a reaction promoter for a reactive plastic molding material but not for said coating,

introducing a reactive plastic molding material into the mold,

said reaction promoter in said coating being selected from the group consisting of a catalyst, a crosslinking promoter and a crosslinking initiator for said reactive plastic molding material and being present in an amount sufficient to transfer said coating composition from said mold surface and bond it to the substrate formed by said reactive molding material,

molding said part and

removing said part from the mold, said molded part upon removal from the mold comprising a plastic substrate and a firmly adherent coating thereon.

17. A molded plastic part having a plastic substrate and a firmly adherent coating thereon produced in accordance with the process of claim **1**.

4,350,740

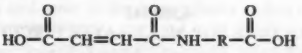
MODIFIED OLEFIN POLYMERS

Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 128,611, Mar. 10, 1980, abandoned. This application Aug. 28, 1981, Ser. No. 297,449
Int. Cl.³ C08F *8/30*
U.S. Cl. 428—461 **10 Claims**

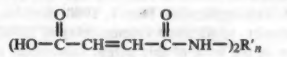
1. In a structure comprising a metal member and a polymeric material bonded thereto, the improvement comprises, providing at the interface between the metal member and the polymeric material, an adhesive comprising an adhesion enhancing amount

a modified olefin polymer comprising the reaction product of 100 parts by weight of monoolefin polymer and about 0.1 to about 20 parts by weight of substituted maleamic acid of the formulas



(a)

in which R is a straight or branched alkylene radical of 1–8 carbon atoms, or



(b)

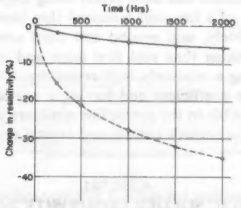
in which n is zero or one, and R' is a straight or branched alkylene radical of 2–18 carbon atoms or arylene of 6–12 carbon atoms.

4,350,741

RESISTOR ELEMENTS

Yo Hasegawa, Nara; Shigeru Yasuda, Hirakata, and Kunio Kojima, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 14, 1980, Ser. No. 207,069
Claims priority, application Japan, Nov. 19, 1979, 54-150410
Int. Cl.³ H01C *1/012, 10/06*
U.S. Cl. 428—473.5 **6 Claims**



1. A method of producing a resistor element which comprises molding a resistor film comprising aromatic polyimide and conductive powder together with a substrate comprising diallyl isophthalate prepolymer, polymerization initiators, inorganic fillers and radical polymerization inhibitors wherein the amount of inhibitors is more than 500 ppm based on the prepolymer.

4. The resistor element produced by the process of claim **1**.

4,350,742

METHOD TO ADHERE ACRYLIC FILMS TO STYRENIC POLYMERS

Richard A. Hall, Naperville, and Edward J. Bernier, Jr., Romeoville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 107,146, Dec. 26, 1979, abandoned. This application Sep. 18, 1980, Ser. No. 188,516
Int. Cl.³ B32B *27/08*
U.S. Cl. 428—520 10 Claims

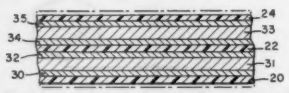
1. A method to form a two-layer laminate consisting essentially of bonding under heat and pressure (a) a substrate consisting essentially of a styrene polymer containing minor amounts of copolymerized α,β-unsaturated carboxylic acid and (b) a polymeric acrylic film formed from a sequentially emulsion polymerized cross-linked polymer of alkyl esters of acrylic and methacrylic acids.

4,350,743

STRUCTURE FOR MULTILAYER CIRCUITS

Jean-Pierre Lazzari, Montfort l'Amaury, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme)

Continuation of Ser. No. 55,497, Jul. 6, 1979, abandoned, which is a continuation of Ser. No. 792,210, Apr. 29, 1977, Pat. No. 4,189,524. This application Dec. 1, 1980, Ser. No. 211,678
Claims priority, application France, May 6, 1976, 76 13553
The portion of the term of this patent subsequent to Feb. 19, 1997, has been disclaimed.
Int. Cl.³ G23P *3/00*
U.S. Cl. 428—622 6 Claims



1. A multilayer device adapted to withstand temperature elevations up to 450° C. without substantial risk of formation of short-circuits between thin conductive layers thereof separated by thinner intervening insulating layers, consisting essentially of a plurality of thin conductive layers stacked with intervening thin layers of insulating refractory material, each conductive layer comprising a composite of a first layer, a second and a third conductive layer, said first layer having a relatively low resistivity and appreciable thermal expansion coefficient and being disposed with opposite faces thereof in contact with adjacent faces of said second and third layers, the opposite faces of said second and third layers being disposed in contact with one face of a first and a second thin insulating material layer, respectively, said second and third conductive layers each being thinner than said first layer and of a conductive material having a relatively high resistivity, a negligible thermal expansion coefficient and having a crystalline structure closely compatible to the crystalline structure of the first conductive layer as regards lattices and crystal sizes.

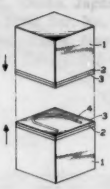
4,350,744

METALLIC SOLDER COMPOSITE BONDING

Elias Snitzer, West Hartford, and James F. Bacon, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 12, 1980, Ser. No. 215,283
Int. Cl.³ C03C *27/02, 27/04;* B32B *17/06*
U.S. Cl. 428—630 6 Claims

1. A bonded composite material comprising a plurality of individual, thermally stable high strength graphite fiber reinforced glass matrix composite pieces held together by a bond comprising a solder layer laid in between two layers of a bonding metal applied to the composite bond surfaces, the metal layers being highly adherent to the composite and the solder and oxidatively stable, and the melting temperature of the



metal and solder layers being higher than the use temperature of the bonded composite.

4,350,745

ELECTROCHEMICAL CELLS HAVING HYDROGEN GAS ABSORBING AGENT

Frank E. Parsen, Irvington, N.Y., and Thomas T. Yatabe, Oakville, Canada, assignors to Duracell Inc., Bethel, Conn.

Filed Dec. 29, 1980, Ser. No. 220,615
Int. Cl.³ H01M *10/52*
U.S. Cl. 429—57 21 Claims

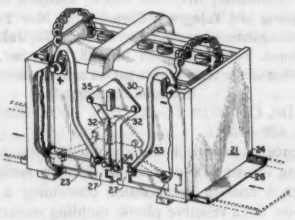
1. An electrochemical cell comprising an anode, a cathode, an electrolyte, and an agent for absorbing hydrogen gas, all operatively associated, said agent comprising a mixture of a member of the group consisting of an oxide of manganese and an oxide of lead; and a powered metal selected from the group consisting of nickel, cobalt and iron.

4,350,746

AUXILIARY POWER SOURCE FOR STARTING A MOTOR VEHICLE

Kenneth R. Chambers, Rte. 9, Box 301-A, Greensboro, N.C. 27409

Continuation-in-part of Ser. No. 32,789, Apr. 23, 1979, abandoned. This application Sep. 17, 1980, Ser. No. 188,222
Int. Cl.³ H01M *2/26*
U.S. Cl. 429—121 4 Claims



1. An auxiliary power source for use in starting a motor vehicle having a defective battery of the type having a housing and positively and negatively charged terminal posts spaced a distance apart on the top surface thereof, said auxiliary power source comprising:

(a) a housing having bottom and side walls and a removable front wall and including a battery therein;

(b) a pair of flat, electrically conductive terminal plates depending from said housing underneath said bottom wall in a plane substantially parallel thereto, said terminal plates being spaced apart horizontally;

(c) means for selectively adjusting the spacing between said plates to substantially correlate to the distance between said vehicle battery terminal posts;

(d) said terminal plates being connected to said battery so that one of said plates is negatively charged and the other is positively charged;

(e) whereby said auxiliary power source may be positioned on top of said defective battery with said positively and negatively charged terminal plates contacting the respective ones of said positively or negatively charged terminal posts, and when the vehicle ignition system is activated voltage is transmitted from said auxiliary power source sufficient to start the vehicle.

4,350,747

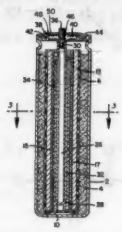
ELECTROCHEMICAL CELL WITH EXTERNALLY COATED HERMETIC SEALS

Vicente S. D. Alberto, Parma, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 16, 1981, Ser. No. 248,217

Int. Cl.³ H01M *2/08*

U.S. Cl. 429—184 **10 Claims**



1. An electrochemical cell system assembled in a closed housing comprising a container having an open end closed by a cover and having a terminal member electronically insulated from and hermetically sealed to said housing by a layer of an insulating material, the improvement wherein the exposed exterior interfacial areas of the insulating material and terminal and the insulating material and housing are coated with an adherent, nonconductive, water-resistant, protective polymeric material.

4,350,748

ELECTROPHOTOGRAPHIC PROCESS FOR THE MANUFACTURE OF PRINTING FORMS OR PRINTED CIRCUITS INCLUDING TRANSFER OF PHOTOCONDUCTIVE COATING FROM TEMPORARY SUPPORT

Erwin Lind, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,665

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1980, 3024718

Int. Cl.³ G03G *13/32, 13/26*

U.S. Cl. 430—49 **9 Claims**

1. In the process for the manufacture of printing forms and printed circuits by coating an electrically conductive support with an organic photoconductor layer and by charging, exposing, and developing the electrostatic image by means of a finely particulate toner, fixing and dissolving the layer away from the non-image areas by means of a decoating medium and, if appropriate, etching of the bared support surface;

the improvement which comprises, for the purpose of coating, transferring the organic photoconductor layer on a temporary support to the electrically conductive support with the aid of heat and pressure.

4,350,749

REVERSE DEVELOPMENT METHOD

Teruyuki Ohnuma, Yokohama; Seiichi Miyakawa, Nagareyama, and Hajime Oyama, Tokyo, all of Japan, assignors to Ricoh Company Ltd., Tokyo, Japan

Filed Feb. 26, 1979, Ser. No. 15,471

Claims priority, application Japan, Feb. 28, 1978, 53-22484; Apr. 11, 1978, 53-42372

Int. Cl.³ G03G *13/09*

U.S. Cl. 430—100 **5 Claims**

1. A reverse development method for use in electrophotography employing one-component type developer consisting of a toner having a volume resistivity not less than 10^{13} Ωcm in powder form to develop a latent electrostatic image formed on a recording member, comprising the steps of:

supplying said toner by a developer supply means having an elastic outer surface serving to press the toner against the latent electrostatic image,

charging said toner to the same polarity as that of the latent electrostatic image,

applying bias voltage to said developer supply means,

setting the polarity of said bias voltage at the same polarity as that of said latent electrostatic image during the time of development of said latent electrostatic image, and

setting the polarity of said bias voltage at the opposite polarity to that of said latent electrostatic image after the latent electrostatic image has been developed.

4,350,750

ELECTROPHOTOGRAPHIC PROCESS

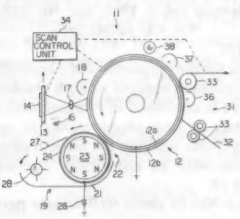
Shigeru Suzuki; Minoru Suzuki; Koichi Suzuki; Kyoji Omi; Yasumori Nagahara; Yoshiharu Kagari; Makoto Hashimoto, and Goro Mori, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 760,891, Jan. 21, 1977, abandoned. This application Aug. 14, 1980, Ser. No. 177,974

Claims priority, application Japan, Jan. 23, 1976, 51-6865

Int. Cl.³ G03G *13/22, 21/00*

U.S. Cl. 430—125 **4 Claims**



1. An electrophotographic process for making a plurality of copies from an original document utilizing a photoconductive member comprising:

(I) making the last copy of said plurality of copies utilizing the steps of:

(a) electrostatically charging the photoconductive member;

(b) radiating a light image of the original document onto the photoconductive member to form an electrostatic image thereon;

(c) applying a developing substance by means of a magnetic brush to the photoconductive member to produce a toner image thereon;

(d) transferring the toner image to a copy sheet;
(e) electrostatically discharging the photoconductive member;
(f) uniformly radiating the photoconductive member with light to further discharge the photoconductive member;
(g) cleaning the photoconductive member by means of the same magnetic brush;
(h) electrostatically discharging the photoconductive member;
(i) uniformly radiating the photoconductive member with light to further discharge the photoconductive member;
(j) cleaning the photoconductive member by means of the same magnetic brush;

(II) making all but the last copy of said plurality of copies comprising only steps (a), (b), (c), (d), (e) and (j);

(III) performing steps (b) and (d) on the same portion of the photoconductive member both for making said last copy as set forth in step (I) and for making all but the last copy of said plurality of copies as set forth in step (II);

(IV) subsequently, after completing steps (I), (II) and (III), indexing the photoconductive member a distance which is other than a multiple or submultiple of the length of the image thereon to provide a new image area partially overlapping the previous image area; and

(V) making one or more further copies utilizing said new image area such that the making of said one or more further copies operates on a different successive overlapping portion of the photoconductive member, whereby fatigue of the drum is uniformly distributed over different successive overlapping portions of the photoconductive member and localized fatigue is thereby precluded.

4,350,751

HIGH RESOLUTION HETEROGENEOUS PHOTOCONDUCTIVE COMPOSITIONS AND METHOD OF PREPARING

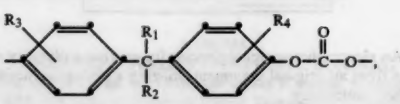
Lawrence E. Contois, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 111,428, Jan. 11, 1980, abandoned. This application Jul. 6, 1981, Ser. No. 280,199
Int. Cl.³ G03G *5/06*
U.S. Cl. 430—135 **3 Claims**

1. In a method for the preparation of a heterogeneous photoconductive composition capable of high resolution wherein a thiopyrylium dye is combined in solution with an electrically insulating polymer to form photoconductive aggregate particles, the improvement wherein the thiopyrylium dye is combined in solution with an electrically insulating polymeric blend consisting of:

(a) from about 50.0 to about 99.9 weight percent of a non-aggregating polymer effective to reduce particle size and particle size distribution of the aggregate particles formed in said blend and

(b) from about 0.1 to about 5.0 weight percent of an aggregating polymer having repeating units according to the structure:



I.

wherein:

R_1 and R_2, taken separately are the same or different, and represent hydrogen or alkyl; or R_1 and R_2 taken together, represent the carbon atoms necessary to form a cyclic hydrocarbon radical having up to 14 ring carbon atoms; and

R_3 and R_4 represent hydrogen or alkyl;

provided that when R_1 and R_2 are both methyl, R_3 and R_4 must be other than hydrogen.

4,350,752

PHOTOGRAPHIC ELEMENTS AND FILM UNITS CONTAINING IMIDOMETHYL BLOCKED PHOTOGRAPHIC REAGENTS

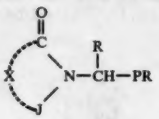
James A. Reczek, and Thomas R. Welter, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,408
Int. Cl.³ G03C *7/00, 5/30, 1/48, 1/40*
U.S. Cl. 430—219 **21 Claims**

1. A photographic image transfer film unit comprising:

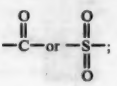
(a) a photosensitive element comprising a support bearing a layer of a silver halide emulsion having associated therewith a dye-image-providing material, and

(b) a dye image-receiving layer, the film unit containing an imidomethyl blocked photographic reagent having the structure:



wherein:

J represents



X represents the atoms to complete a heterocyclic nucleus containing at least one 5- or 6-membered ring;

R represents hydrogen, alkyl of 1 to 4 carbon atoms or aryl of 6 to 12 carbon atoms; and

PR represents the residue of an organic photographic reagent containing a heteroatom through which it is joined to the imidomethyl blocking group and which, upon unblocking, is capable of reacting with another component of the film unit.

4,350,753

POSITIVE ACTING COMPOSITION YIELDING PRE-DEVELOPMENT HIGH VISIBILITY IMAGE AFTER RADIATION EXPOSURE COMPRISING RADIATION SENSITIVE DIAZO OXIDE AND HALOALKYL-S-TRIAZINE WITH NOVOLAK AND DYESTUFF

James Shelnut, Carmel; Eugene Golda, Monsey; Alan Wilkes, Brewster, and Ken-ichi Shimazu, Briarcliff Manor, all of N.Y., assignors to Polychrome Corporation, New York, N.Y.

Filed Jun. 15, 1981, Ser. No. 273,790
Int. Cl.³ G03C *1/54, 1/60;* **G03F** *7/08*
U.S. Cl. 430—190 **13 Claims**

1. A colored, positive-acting composition whose color disappears or decreases upon irradiation comprising an admixture of,

I. at least one acid-free, aqueous alkali-soluble novolak resin as the major resin in the composition;

II. at least one haloalkyl-s-triazine radiation-sensitive component which upon irradiation yields acidic products;

III. at least one acid-sensitive dyestuff which upon contact with the product of irradiation of component II is rendered colorless or much less intensely colored than before such contact; and

IV. at least one positive-acting diazo oxide which upon irradiation yields acidic products.

4,350,754

BLOCKED DEVELOPMENT RESTRAINERS

James R. Bartels-Keith, Lexington, and Anthony J. Puttick, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 12, 1981, Ser. No. 273,039
Int. Cl.³ G03C 1/40, 5/54, 1/10, 3/00
U.S. Cl. 430—219 26 Claims

17. A diffusion transfer film unit comprising:

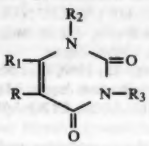
(a) a photosensitive element comprising a support, a silver halide emulsion in a layer carried by said support and an image dye-providing material in a layer carried by said support on the same side thereof as said silver halide emulsion;

(b) a second sheet-like element adapted to be superposed on said photosensitive element during or after photoexposure;

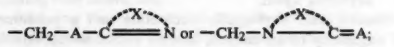
(c) an image receiving layer positioned in one of said photosensitive or second sheet-like elements;

(d) a rupturable container releasably holding an aqueous alkaline processing composition and so positioned as to be adapted to distribute said processing composition between predetermined layers of said elements; and

(e) present in at least one of said photosensitive and second sheet-like elements a compound represented by the formula



wherein R is



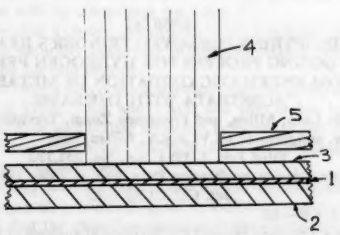
A is sulfur or selenium; X represents the nonmetallic atoms necessary to form a nucleus which completes a five or six membered heterocyclic moiety; R_1 is H or alkyl having from 1 to 6 carbon atoms; R_2 is H or a hydrolyzable group; and R_3 is H, alkyl or a hydrolyzable group.

4,350,755

AUGER MICROLITHOGRAPHY

Chia-Gee Wang, P.O. Box 211, Millwood, N.Y. 10546

Filed Jul. 23, 1980, Ser. No. 171,573
Int. Cl.³ G03C 5/00, 5/04; G21G 5/00
U.S. Cl. 430—264 10 Claims



1. A method of producing a latent image on a wafer material for use in the production of micro-electronic circuits comprising: coating the surface of the wafer with a carrier in which are disbursed silver halide crystals and exposing a desired portion of the coating to monochromatic X-rays having a wavelength to induce an inner shell ionization of the halide atoms with subsequent auger cascade, thereby to sensitize the silver halide crystals exposed to the monochromatic X-rays.

9. A method according to claim 8, wherein the exposed silver-bromide crystals are developed to form silver grains by the use of a developer which results in localized hardening of the gelatin in the exposed area of the layer, the silver grains then being oxidized for dissolution together with the non-exposed areas of the layer, to leave exposed desired areas of the wafer, the remaining area of the wafer being coated by the hardened gelatin which is impermeable to the materials to be used for etching the exposed surfaces of the wafer.

4,350,756

PROCESSING OF RADIATION SENSITIVE PLATES

Jeremy R. Burch, Wilberfoss, and David E. Murray, Leeds, both of England, assignors to Vickers Limited, London, England

Filed Feb. 4, 1981, Ser. No. 231,416
Claims priority, application United Kingdom, Jan. 29, 1980, 8002934
Int. Cl.³ G03F 7/02; G11D 17/00
U.S. Cl. 430—331 12 Claims

9. A method of processing an imagewise exposed negative working radiation sensitive plate which comprises the step of developing the plate using a substantially aqueous developer comprising an aqueous solution of a non-ionic surfactant, a salt of an aromatic carboxylic acid, and a salt of an aliphatic carboxylic acid containing up to nine carbon atoms.

4,350,757

METHOD FOR MAKING VISIBLE RESIDUAL MOISTURE DISTRIBUTIONS IN PHOTOGRAPHIC WET FILM LAYERS SUBJECTED TO AN ONCOMING FLOW

Bernhard Montag, Forchheim; Gert Mages, Nuremberg, and Heinrich Opitz, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 18, 1981, Ser. No. 235,672
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008266
Int. Cl.³ E03C 5/26
U.S. Cl. 430—422 4 Claims

1. A method for making visible by photochemical means residual moisture distributions in photographic wet film layers exposed to flow, comprising:

(a) providing a silver halide-containing photographic film diffusively pre-exposed in daylight;

(b) placing said film in an aqueous swelling agent solution until the gelatin layer of said film is saturated, said swelling agent solution containing a member selected from (1) a reducing agent and (2) an alkali material;

(c) applying said swelled film to a surface;

(d) exposing said surface having said swelled film thereon to a flow to obtain invisible residual moisture distributions in said film;

(e) immersing said film in a solution selected from (1) a substantially water-free alcoholic alkali solution where the swelling agent solution of step (b) contains a reducing agent, and (2) a substantially water-free alcoholic solution of a reducing agent where the swelling agent solution of step (b) contains an alkali material, so as to make visible said moisture distributions.

4,350,758

PHOTOGRAPHIC EMULSION CONTAINING COPPER HALIDE HOST CRYSTALS

Takeo Koitabashi; Syozi Matsuzaka; Toshifumi Iijima, and Tetsuya Harada, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1980, Ser. No. 203,513
Claims priority, application Japan, Nov. 12, 1979, 54-146739
Int. Cl.³ G03C 1/02
U.S. Cl. 430—567 7 Claims

1. A photographic gelatin silver halide emulsion comprising a composite crystal consisting essentially of (A) (i) a solid solution crystal of a copper halide and a silver halide or (ii) a copper halide, as a host crystal having a mean granular diameter of at least 0.05μ, and (B) a silver halide which is epitaxially junctioned onto said host crystal.

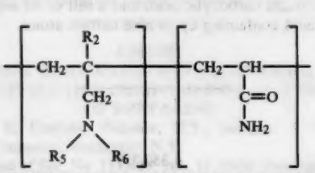
4,350,759

ALLYL AMINE POLYMERIC BINDERS FOR PHOTOGRAPHIC EMULSIONS

Maurice J. Fitzgerald, Canton, and Thomas E. Platt, Manchester, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 30, 1981, Ser. No. 249,065
Int. Cl.³ G03C 1/72
U.S. Cl. 430—630 6 Claims

1. A photosensitive silver halide emulsion comprising silver halide crystals disposed in an emulsion binder comprising an allylamine copolymer having repeating units of the general formula:



wherein R_2 is hydrogen, methyl, or chloro; and R_5 and R_6 are independently selected from hydrogen and methyl, or are chemically joined to form a 6 membered heterocyclic ring structure.

4,350,760

METHOD FOR THE SEPARATION OF A PROTEIN SUBSTANCE FROM A SOLUTION CONTAINING THE SAME BY AFFINITY FILTRATION AND APPLICATION OF SAID METHOD TO ENZYMATIC ASSAYS

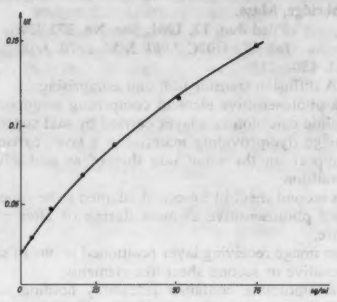
Jean-Claude Nicolas; Beatrice Terouanne; Bernard Descomps, and Andre Crastes de Paulet, all of Montpellier, France, assignors to Institut National de la Sante et de la Recherche Medicale, Paris, France

Filed Jun. 17, 1980, Ser. No. 160,271
Claims priority, application France, Jun. 21, 1979, 79 15992
Int. Cl.³ G01N 33/54
U.S. Cl. 435—7 11 Claims

1. A method for the direct enzymatic assay for the presence of a binding agent by assaying for the product of reaction of a binding agent with an enzyme labeled substance, said binding agent having affinity for said enzyme-labeled substance, comprising the steps of:

reacting said binding agent with said enzyme-labeled substance to give a reaction solution containing a reaction product having a molecular weight higher than the molecular weight of said enzyme-labeled substance;

separating enzyme-labeled substance from said reaction product by filtering said solution through a gel having pores of a size sufficient to exclude said reaction product, said gel being coupled with a ligand for which said enzyme has affinity; and



measuring the enzymatic activity of said solution after said solution passes through said gel.

4,350,761

METHOD OF AND REAGENTS FOR QUANTITATIVE ANALYSIS OF CYCLIC NUCLEOTIDES

Itaru Yamamoto, Okayama, Japan, assignor to Yamasu Shoyu Kabushiki Kaisha, Chiba, Japan

Filed May 15, 1980, Ser. No. 149,959
Claims priority, application Japan, May 18, 1979, 54-61669
Int. Cl.³ G01N 33/54; C12Q 1/00; C12N 9/96
U.S. Cl. 435—7 12 Claims

1. A method for the quantitative analysis of cyclic nucleotides which comprises:

acylating a cyclic nucleotide in an assay sample by using an acylating agent;

causing said acyl-cyclic nucleotide and a predetermined quantity of an enzyme-labeled cyclic nucleotide formed by bonding a cyclic nucleotide corresponding to the cyclic nucleotide to be assayed and an enzyme through a dicarboxylic acid to undergo a competitive antigen-antibody reaction with a predetermined quantity of an antibody corresponding to the cyclic nucleotide to be assayed;

separating the enzyme-labeled cyclic nucleotide which has become bonded to said antibody and the enzyme-labeled cyclic nucleotide which has not become bonded thereto; and

measuring the enzyme activity of either of said enzyme-labeled cyclic nucleotides thereby to determine the quantity of the cyclic nucleotide.

4,350,762

AMINOPYRINE IMPROVED TRINDER'S REAGENT AND DOSING PROCESS FOR HYDROGEN PEROXIDE FROM ENZYMATIC OXIDATION OF METABOLIC SUBSTRATA WITH THE SAME

Ugo De Luca, Milan, and Francesco Zoppi, Treviglio, both of Italy, assignors to ELVI S.p.A., Milan, Italy

Filed Feb. 3, 1981, Ser. No. 231,152
Claims priority, application Italy, Feb. 4, 1980, 19672 A/80
Int. Cl.³ C12Q 1/62
U.S. Cl. 435—10 3 Claims

1. In a Trinder's reagent for the clinical analysis of hydrogen peroxide by the enzymatic oxidation of a metabolic substrate in the presence of bilirubin, said reagent containing 2,4-dichlorophenyl sulphonate and 4-aminophenazone; the improvement in which the Trinder's reagent contains 1 to 30 g/l of aminopyrine to block the interferring action of said bilirubin.

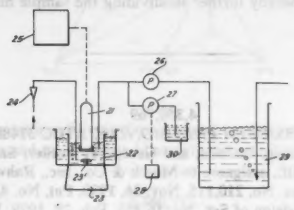
4,350,763
METHOD FOR DETERMINING BIOCHEMICAL OXYGEN DEMAND

Shuichi Suzuki, Tokyo, and Isao Karube, Tachikawa, both of Japan, assignors to Ajinomoto Company, Inc., Tokyo, Japan

Continuation of Ser. No. 889,282, Mar. 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 840,650, Oct. 11, 1977, abandoned. This application Apr. 7, 1980, Ser. No. 138,121

Int. Cl.³ C12Q *1/29*

U.S. Cl. 435—29 **6 Claims**



1. A method of determining the biochemical oxygen demand of an aqueous liquid containing organic matter which comprises

(a) contacting a sample of said liquid with molecular oxygen and with a microbial electrode comprising an oxygen-sensitive electrode covered by first and second membranes which are permeable to said liquid and oxygen and impermeable to microbial cells and microorganisms immobilized or confined between the membranes, said microorganisms being capable of aerobically metabolizing said organic matter and thereby consuming said oxygen,

(b) electrochemically sensing the rate of consumption or the decrease in steady state concentration of said oxygen caused by said microorganisms during a period not exceeding two hours; and

(c) calculating the biochemical oxygen demand from said rate of consumption or said decrease of the oxygen by making use of the direct linear relationship between the biochemical oxygen demand and the rate of consumption or the decrease of the amount of oxygen.

4,350,764
MICROBIOLOGICAL SYNTHESIS OF BETA ENDORPHIN

John D. Baxter; Ivy Fettes, both of San Francisco, Calif., and John Shine, Curtin, Australia, assignors to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 10, 1980, Ser. No. 128,711

Int. Cl.³ C12P *21/02*; C12N *15/00, 1/20, 1/00*

U.S. Cl. 435—69 **11 Claims**

1. A method of making a peptide having opiate agonist or antagonist activity comprising the steps of:

(a) providing a cloned mammalian DNA fragment comprising a naturally occurring mammalian codon sequence, coding for said peptide,

(b) providing a stop condon selected from the group consisting of TGA, TAA and TAG, said stop codon being in phase with said coding sequence adjacent to and in reading frame phase with a codon for a COOH-terminal amino acid of said peptide,

(c) inserting said coding sequence into an internal position in an expressible bacterial gene in a DNA transfer vector, such that the cloned mammalian coding sequence is followed by said stop codon and is in the same orientation with respect to translation as the bacterial gene, such that readthrough translation of the inserted coding sequence can take place resulting in a fusion protein comprising said peptide, said peptide being joined to the remainder of said fusion protein by an arginine residue,

(d) protecting said fusion protein with a reagent capable of reacting with lysine epsilon amino groups in order to prevent trypsin action at the site of said lysine residues,

(e) digesting the fusion protein with trypsin, and

(f) deprotecting the lysine residues thereby yielding a peptide having opiate agonist or antagonist activity.

4. A DNA transfer vector having an expressible bacterial gene and having inserted therein a nucleotide sequence comprising codons coding for a peptide having opiate agonist or antagonist activity, said nucleotide sequence comprising a naturally-occurring mammalian sequence coding for said peptide and being followed by a stop codon selected from the group consisting of TGA, TAA and TAG, said stop codon being in phase with said coding sequence and being adjacent to and in reading frame phase with a codon coding for a COOH-terminal amino acid of said peptide, said nucleotide sequence being inserted in such orientation with respect to said bacterial gene that expression of said gene results in synthesis of a protein comprising said peptide.

4,350,765
METHOD FOR PRODUCING ETHANOL WITH IMMOBILIZED MICROORGANISM

Ichiro Chibata, Suita; Jyoji Kato, Yawata, and Mitsuru Wada, Nara, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Jun. 5, 1980, Ser. No. 156,868

Claims priority, application Japan, Jun. 13, 1979, 54-74972; Sep. 28, 1979, 54-125966

Int. Cl.³ C12P *7/06*; C12N *11/10, 11/04*

U.S. Cl. 435—161 **11 Claims**

1. A method for producing ethanol by conversion reaction of fermentative sugar into ethanol, which comprises the steps of:

(1) contacting an ethanol-producing microorganism immobilized in a sulfated polysaccharide gel containing not less than 10 w/w % of sulfate (—SO_3H) moiety with a nutrient culture broth containing not more than 100 mg/ml of a fermentative sugar, said ethanol-producing microorganism being selected from the group consisting of the genera of Saccharomyces and Zymomonas and said microorganism being immobilized in said sulfated polysaccharide gel as a dense layer near the surface of said gel,

(2) microbiologically converting said sugar into ethanol until the concentration of the sugar in the broth is lowered to not more than 20% of its initial concentration;

(3) contacting the broth from step (2) and said immobilized microorganism with additional fresh culture broth containing not less than 100 mg/ml of the sugar until ethanol is produced in a concentration in the broth of not less than 75 mg/ml; and then

(4) separating the broth containing the ethanol produced.

4,350,766
PENTOSE SYRUP PRODUCTION FROM HEMICELLULOSE

Robert L. Mehlberg, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed Aug. 1, 1980, Ser. No. 174,454

Int. Cl.³ C13K *1/02*; C12P *7/06*

U.S. Cl. 435—161 **16 Claims**

1. A method for the production of pentose syrup from hemicellulose material which comprises the separate steps of:

(a) hydrolyzing hemicellulose material in the presence of from about 1% to 15% of an acid, selected from sulfuric and hydrochloric acid, at a liquid:solid ratio between 0.1 and 4.0 by heating said material to a reaction temperature of from 90° to 120° C. for a period of time sufficient to hydrolyze substantially all of the hemicellulose; and thereafter

(b) subjecting the hydrolyzed material to leaching at a temperature of from about 15° to 100° C. with an aqueous medium by percolating said medium through said hydro-

lyzed material at a velocity of from 0.016 to 0.83 mm/sec; and

(c) recovering a syrup containing at least 5 percent of pentoses, whereby there is obtained a pentose syrup having a low pH and suitable for storage for extended periods of time without microbial degradation, said steps (a) and (b) being carried out in the same reaction vessel which is characterized as a packed bed reactor.

4,350,767

METHOD FOR ISOLATING AND PURIFYING ENZYMES FROM A CRUDE ENZYME SOLUTION

Ulrich Zimmermann, Jülich, Fed. Rep. of Germany; Mohammed Saleemuddin, Aligarh, India, and Günter Pilwat, Niederzier, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 51,197, Jun. 22, 1979, abandoned. This application May 15, 1981, Ser. No. 264,022

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1978, 2828235

Int. Cl.³ C12N *9/00, 9/04*

U.S. Cl. 435—183 **6 Claims**

1. A method of isolating and purifying selected enzymes from a crude enzyme solution made from animal organs or tissues, the method including the steps of:

contacting the crude enzyme solution with an adsorption medium composed of hemolyzed, ruptured, erythrocyte membranes, the membranes having an affinity to bind by adsorption the selected enzymes thereto, to thereby adsorb the selected enzyme on the membrane;

removing the membranes from contact with the crude enzyme solution with the selected enzymes adsorbed on the membranes, and

separating the selected enzyme from the membranes by elution.

4,350,768

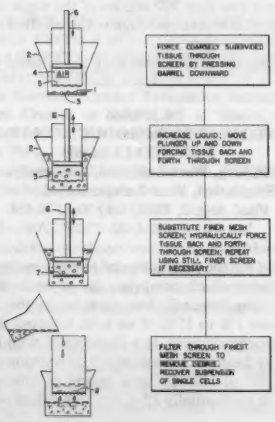
METHOD FOR PREPARING SINGLE CELL SUSPENSION

Claude Tihon, Manlius, and M. E. Curry, Syracuse, both of N.Y., assignors to Bristol Myers Company, New York, N.Y.

Filed Sep. 19, 1980, Ser. No. 188,710

Int. Cl.³ C12N *5/02;* **B01D** *29/00;* **B26B** *27/00*

U.S. Cl. 435—241 **20 Claims**


FORCE COARSELY SUBDIVIDED TISSUE THROUGH SCREEN BY PRESSING BARREL DOWNWARD
AIR
INCREASE LIQUID; MOVE PLUNGER UP AND DOWN FORCING TISSUE BACK AND FORTH THROUGH SCREEN
SUBSTITUTE FINER MESH SCREEN; HYDRAULICALLY FORCE TISSUE BACK AND FORTH THROUGH SCREEN; REPEAT USING STILL FINER SCREEN IF NECESSARY
FILTER THROUGH FINEST MESH SCREEN TO REMOVE DEBRIS, RECOVER SUSPENSION OF SINGLE CELLS

1. The method for preparing a suspension of single tissue cells comprising the steps of:

providing a subdivided tissue sample;

combining the subdivided sample material with sufficient buffered aqueous liquid medium to encompass the sample;

introducing the resulting combination into an expansible; and contractible chamber defined in part by a finely-apertured foraminous wall portion;

providing a container to receive the resulting combination; and

forcibly contracting the chamber to force the sample material through the foraminous wall portion into said container, thereby further subdividing the sample material.

4,350,769

***KLEBSIELLA PNEUMONIAE,* ATCC 31488**

Kenneth S. Kang, LaJolla, and George T. Veeder, San Diego, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 210,115, Nov. 24, 1980, Pat. No. 4,311,795, which is a division of Ser. No. 16,253, Feb. 28, 1979, Pat. No. 4,291,156. This application Jul. 13, 1981, Ser. No. 282,679

Int. Cl.³ C12N *1/00;* **C12R** *1/22*

U.S. Cl. 435—243 **1 Claim**

1. The biologically pure lyophilized culture of a strain of *Klebsiella pneumoniae,* ATCC 31488.

4,350,770

MICROBIOLOGICAL PROCESS FOR REMOVING OLEAGINOUS MATERIAL FROM WASTEWATER AND MICROBIOLOGICAL COMBINATION CAPABLE OF SAME

Philip W. Spraker, Troutville, Va., assignor to Sybron Corporation, Rochester, N.Y.

Continuation of Ser. No. 4,241, Jan. 17, 1979, Pat. No. 4,288,545. This application May 7, 1981, Ser. No. 261,394

The portion of the term of this patent subsequent to Sep. 8, 1998, has been disclaimed.

Int. Cl.³ C12N *1/20*

U.S. Cl. 435—253 **6 Claims**

1. A microbial synergist combination comprising:

(a) a microorganism of the strain *Pseudomonas aeruginosa* $SGRR_2$ (ATCC-31480); and

(b) at least one of:

(i) a microorganism of the genus Bacillus; and

(ii) a microorganism of the genus Pseudomonas other than said strain *Pseudomonas aeruginosa* $SGRR_2$, said combination of microorganisms (a) and (b) synergistically acting to utilize oleaginous materials of animal origin or containing the same as a source of assimilable carbon and degrade said oleaginous materials of animal origin or containing the same.

4,350,771

OXIDATION RESISTANT SILICON NITRIDE CONTAINING RARE EARTH OXIDE

J. Thomas Smith, Acton, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

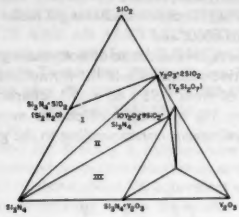
Continuation of Ser. No. 944,515, Sep. 20, 1978, abandoned. This application Sep. 18, 1981, Ser. No. 303,445

Int. Cl.³ C04B *35/50, 35/58*

U.S. Cl. 501—97 **4 Claims**

1. A polycrystalline ceramic body consisting essentially of a composition of Si_3N_4, SiO_2 and Y_2O_3, said composition lying within a triangular region of the Si_3N_4-SiO_2-Y_2O_3 ternary

composition diagram bounded by lines joining the points Si_3N_4, $Y_2O_3.2SiO_2$, $10Y_2O_3.9SiO_2.Si_3N_4$, and $Si_3N_4.Y_2O_3$,



said compositions having from about 2 to about 4 weight percent SiO_2 and up to about 13 weight percent Y_2O_3.

4,350,772

PROCESS FOR THE PREPARATION OF HYDROCARBONS FROM SYNTHESIS GAS

Martin F. M. Post, and Lambert Schaper, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 95,027, Nov. 16, 1979, abandoned. This application Mar. 6, 1981, Ser. No. 241,192

Claims priority, application Netherlands, Nov. 30, 1978, 7811766

Int. Cl.³ C07C *1/04*

U.S. Cl. 518—714 9 Claims

1. In a process for the preparation of a hydrocarbon mixture of C_5, containing aromatics, which comprises contacting a mixture of carbon monoxide and hydrogen at a temperature of 200°–500° C., a pressure of 1–150 bar and a space velocity of 50–5000 Nl gas/l catalyst/h, temperature with a mixture of two catalysts, said mixture consisting essentially of a catalyst X and a catalyst Y, catalyst X being capable of catalysing the conversion of an H_2/CO mixture into substantially methanol and/or dimethyl ether and containing zinc together with chromium, and catalyst Y being a crystalline silicate, which silicate is characterized by having the following properties after 1 hour's calcining in air at 500° C.:

(a) thermally stable up to a temperature above 600° C.,

(b) an X-ray powder diffraction pattern showing, inter alia, the reflections given in Table A.

TABLE A

Radiation: Cu—Ka 2 θ	Wavelength 0.15418 nm relative intensity
7.8–8.2	S
8.7–9.1	M
11.8–12.1	W
12.4–12.7	W
14.6–14.9	W
15.4–15.7	W
15.8–16.1	W
17.6–17.9	W
19.2–19.5	W
20.2–20.6	W
20.7–21.1	W
23.1–23.4	VS
23.8–24.1	VS
24.2–24.8	S
29.7–30.1	M

where the letters used have the following meanings: VS=very strong; S=strong; M=moderate; W=weak; θ=angle according to Bragg's law,

(c) after evacuation at 2×10^{-9} bar and 400° C. for 16 hours and measured at a hydrocarbon pressure of 8×10^{-2} bar and 100° C., the adsorption of n-hexane is at least 0.8 mmol/g, the adsorption of 2,2-dimethylbutane at least 0.5 mmol/g, and the ratio

$$\frac{\text{adsorption of n-hexane}}{\text{adsorption of 2,2-dimethylbutane}} \text{ at least 1.5,}$$

(d) the composition, expressed in moles of the oxides, is as follows: $y.(1.0\pm0.3)$. $M_2O.y.Al_2O_3SiO_2$, where M=H and alkali metal and y is 0.01–0.02, the improvement which comprises that the silicate contains 0.1–10% by weight on the silicate of at least one element selected from the group of manganese, calcium, magnesium and titanium.

4,350,773

WEAKLY ACIDIC CATION EXCHANGE RESIN AND PROCESS FOR PRODUCING SAME

Takaharu Itagaki, Yokohama, and Hidenaga Ouchi, Komae, both of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Division of Ser. No. 174,566, Aug. 4, 1980, Pat. No. 4,306,031. This application Jul. 6, 1981, Ser. No. 280,522

Claims priority, application Japan, Aug. 14, 1979, 54-103352; Oct. 8, 1979, 54-129745

Int. Cl.³ B01J *41/12*; C08F *16/06*

U.S. Cl. 521—31 15 Claims

1. A weakly acidic cation exchange resin which is obtainable by a reaction of glyoxylic acid and a polyvinyl alcohol cross-linked by cross-linking groups each containing two or more carbon atoms, and has an exchange capacity of 3 meq/g or greater and a swelling volume of 10 ml/g or smaller.

4,350,774

POLYMERIC FOAM CAULKING COMPOSITIONS

Frank Scotti, 450 Indian Rd., Wayne, N.J. 07470, and Edward H. Page, 1021 Hillcrest Ave., Ridgewood, N.J. 07450

Continuation of Ser. No. 103,428, Dec. 14, 1979, abandoned. This application Sep. 4, 1981, Ser. No. 299,507

Int. Cl.³ C08J *9/12*, *9/14*

U.S. Cl. 521—95 32 Claims

1. A composition suitable for preparing a stable cellular foam, said composition comprising:

an emulsion of one or more foamable polymers of monomers selected from the group consisting of acrylic acid, methacrylic acid and alkyl esters of acrylic and methacrylic acids wherein the alkyl moiety includes from one to eleven carbon atoms, said polymers having a glass transition temperature of less than about 15° C.; a filler and

dispersed in said emulsion, a foam forming amount of a mixture of nitrous oxide and a volatile organic liquid compound selected from the group consisting of a volatile hydrocarbon, a volatile halogenated hydrocarbon and mixtures thereof; wherein the weight percent ratio of said nitrous oxide to said organic liquid compound is about 1.5:1 to about 6:1 and wherein said foam is self-leveling, water resistant and the volume of said foam is not greater than about six times the volume of said unfoamed composition.

4,350,775

PROCESS FOR THE PRODUCTION OF ALKALI METAL SILICATE-ORGANIC PLASTICS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Division of Ser. No. 233,151, Feb. 10, 1981, which is a continuation-in-part of Ser. No. 146,474, May 5, 1980, Pat. No. 4,273,908, which is a continuation-in-part of Ser. No. 36,350, May 7, 1979, abandoned, which is a continuation-in-part of Ser. No. 889,932, Mar. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 663,924, Mar. 4, 1976, Pat. No. 4,097,424, which is a continuation-in-part of Ser. No. 599,000, Jul. 7, 1975, Pat. No. 4,072,637, which is a continuation-in-part of Ser. No. 262,485, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application Aug. 10, 1981, Ser. No. 300,302

Int. Cl.[3] C08J *9/14*

U.S. Cl. 521—100 25 Claims

1. The process for the production of foamed polyurethane silicate product by mixing and reacting the following components:

(a) an aqueous alkali metal silicate solution in the amount of 100 parts by weight;

(b) a polymerizable unsaturated organic compound in the amount of 5 to 100 parts by weight;

(c) a mono or polycarboxylic acid salt-forming compound in the amount of 1 to 10 parts by weight;

(d) an initiator in a catalytic amount;

(e) 50 to 200 parts by weight of a polyisocyanate, up to 10% by weight of a polyisocyanate initiator, up to 20% by weight of an emulsifier, up to 50% by weight of a blowing agent, up to 20% by weight of a regulator, and 1 to 150 parts by weight of a polyol are mixed with the emulsive mixture of Components (a), (b), (c) and (d), thereby producing a foamed polyurethane silicate product; percentages are based on weight of the Components (a), (b), (c) and (d).

4,350,776

METHOD OF MAKING A LOW-FRIABILITY, THERMOSETTING FOAM

Stuart B. Smith, Conyers, Ga., assignor to Thermoset AG, Switzerland

Filed Feb. 26, 1981, Ser. No. 238,467

Int. Cl.[3] C08J *9/14*

U.S. Cl. 521—110 15 Claims

1. A method for preparing a thermosetting foam product, which method comprises reacting a furfuryl-alcohol polymer with a phenol-formaldehyde resin, having a mole ratio of phenol to formaldehyde of from about 1:1.2 to 1:2.0, in the presence of a blowing agent and a catalytic amount of a strong acid catalyst, to effect the generally simultaneous condensation of the phenol-formaldehyde resin and the polymerization of the furfuryl-alcohol polymer, to provide an integral thermosetting foam produce characterized by low-friability, high-compressive-strength and good flame-retardant properties.

4,350,777

IMPERMEABLE MOLDED ARTICLES OF CELLULAR POLYURETHANE ELASTOMERS PRODUCED WITH ORGANOFUNCTIONAL POLYSILOXANE-DERIVATIVES AND THEIR USE AS SPRING ELEMENTS

Paul Henrichs, Bergisch-Gladbach; Peter Haas, Haan; Hans-Georg Hoppe, Leichlingen, and Wolfgang Grimm, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 12, 1981, Ser. No. 242,963

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012125; Aug. 1, 1980, 3029272

Int. Cl.[3] C08G *18/38*

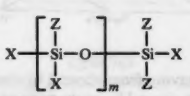
U.S. Cl. 521—110 12 Claims

1. A method of producing an impermeable, fine cellular polyurethane elastomer having a density of from 0.3 to 0.8 g/cm^3 comprising reacting

(A) organic polyisocyanates,

(B) polyhydroxyl compounds having a molecular weight of from 400 to 6000, and

(C) water, the equivalent ratio of isocyanate groups to isocyanate reactive compounds in the formulation being within the range of from 0.95:1 to 1.15:1, characterized in that from 0.1 to 3% by weight of one or more organofunctional polysiloxanes corresponding to the general formula



(I)

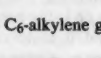
in which

m represents an integer of from 1 to 500, the groups

Z which may be the same or different represent C_1-to C_5-alkyl or C_6-to C_{15}-aryl or siloxyl groups and the groups

X have the same meaning as Z, with the proviso that at least 1, but not more than 5 of the radicals X represent H—Y—R groups, in which

Y represents —NR′—, —O—



or —S—,

R represents a C_1-to C_6-alkylene group which may contain hetero atoms, and

R′ represents hydrogen, a C_1-to C_6-alkyl group or a C_5-to C_9-cycloalkyl group

are added to the reaction mixture.

4,350,778

METHOD FOR MAKING RIM POLYURETHANE ELASTOMERS USING AS THE CATALYST SYSTEM A HYDROXYALKYLAMINE, DIBUTYLTIN DILAURATE AND AN ALKYLTIN MERCAPTIDE

Richard J. G. Dominguez; Doris M. Rice, and Robert L. Zimmerman, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 29, 1981, Ser. No. 268,460

Int. Cl.[3] C08G *18/14*

U.S. Cl. 521—118 4 Claims

1. In a method for making a polyurethane elastomer of significantly improved properties wherein an aromatic polyisocyanate, a polyol of above about 500 equivalent weight, a chain extending agent comprising a low molecular weight active hydrogen containing compound of at least 2 functionality and a catalyst system is injected via a RIM machine into a mold cavity of the desired configuration the improvement which comprises

using as the catalyst system N-hydroxypropyl-N′,N′,N″,N″-tetramethyliminobispropylamine, dibutyltin dilaurate and an alkyltin mercaptide.

4,350,779

METHOD FOR MAKING RIM POLYURETHANE ELASTOMERS USING AS THE CATALYST SYSTEM METHYLDIETHANOLAMINE, DIBUTYLTIN DILAURATE AND AN ALKYLTIN MERCAPTIDE

Richard J. G. Dominguez, and David R. McCoy, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 29, 1981, Ser. No. 268,459
Int. Cl.³ C08G 18/14
U.S. Cl. 521—126 4 Claims

1. In a method for making a polyurethane elastomer of significantly improved properties wherein an aromatic polyisocyanate, a polyol of above about 500 equivalent weight, a chain extending agent comprising a low molecular weight active hydrogen containing compound of at least 2 functionality and a catalyst system is injected via a RIM machine into a mold cavity of the desired configuration the improvement which comprises:

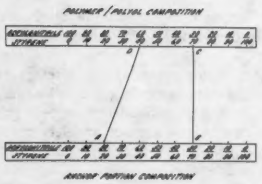
using as the catalyst system methyldiethanolamine, dibutyltin dilaurate and an alkyltin mercaptide.

4,350,780

POLYURETHANES MADE WITH POLYMER/POLYOLS PREPARED VIA PREFORMED STABILIZERS

Russell Van Cleve; George H. Armstrong, and Donald W. Simroth, all of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 26,576, Apr. 3, 1979, Pat. No. 4,242,249, which is a continuation-in-part of Ser. No. 752,818, Dec. 20, 1976, abandoned. This application Aug. 14, 1980, Ser. No. 178,642
Int. Cl.³ C08G 18/14, 18/63
U.S. Cl. 521—137 6 Claims



1. A method for producing a polyurethane by reacting a mixture comprising (A) a polymer/polyol composition and (B) an organic polyisocyanate in the presence of (C) a catalyst for the reaction of (A) and (B) to produce a polyurethane, wherein the polymer/polyol composition (A) is produced by a process which comprises:

adding a preformed stabilizer, which is a graft or addition copolymer comprising (a) an anchor portion consisting essentially of a polymer of an ethylenically unsaturated monomer or a mixture of such monomers chemically bonded to (b) a solvatable portion consisting of a propylene oxide polymer having a number average molecular weight of at least about 800, said preformed stabilizer having a viscosity in excess of 40,000 centipoises at 25° C., to a normally liquid polypropylene oxide polyol having a number average molecular weight of at least about 400 and a hydroxyl number of from about 20 to about 280, said preformed stabilizer being present in the polyol in an amount sufficient to stabilize a polymer particle dispersed therein against phase separation, in order to provide a homogeneous mixture of said preformed stabilizer and said polyol, and subsequently

polymerizing a reaction mixture comprising (I) said homogeneous mixture of preformed stabilizer and polyol, (II) from about 10 to about 40 weight percent of an ethylenically unsaturated monomer or a mixture of such monomers, said weight percent being based on the total weight of the monomer or monomer mixture and the polyol in said homogeneous mixture, and (III) a free radical catalyst.

2. A method for producing a polyurethane foam by reacting and foaming a mixture comprising (A) a polymer/polyol composition, (B) an organic polyisocyanate, (C) a catalyst for the reaction of (A) and (B) to produce the polyurethane, (D) a blowing agent, and (E) a foam stabilizer, wherein the polymer/polyol composition (A) is produced by a process which comprises:

adding a preformed stabilizer, which is a graft or addition copolymer comprising (a) an anchor portion consisting essentially of a polymer of an ethylenically unsaturated monomer or a mixture of such monomers chemically bonded to (b) a solvatable portion consisting of a propylene oxide polymer having a number average molecular weight of at least about 800, said preformed stabilizer having a viscosity in excess of 40,000 centipoises at 25° C., to a normally liquid polypropylene oxide polyol having a number average molecular weight of at least about 400 and a hydroxyl number of from about 20 to about 280, said preformed stabilizer being present in the polyol in an amount sufficient to stabilize a polymer particle dispersed therein against phase separation, in order to provide a homogeneous mixture of said preformed stabilizer and said polyol, and subsequently

polymerizing a reaction mixture comprising (I) said homogeneous mixture of preformed stabilizer and polyol, (II) from about 10 to about 40 weight percent of an ethylenically unsaturated monomer or a mixture of such monomers, said weight percent being based on the total weight of the monomer or monomer mixture and the polyol in said homogeneous mixture, and (III) a free radical catalyst.

4,350,781

PROCESS FOR THE PREPARATION OF POLYMER PRECURSORS CONTAINING OXAZOLIN-2-ONE RINGS

Werner Rasshofer, Cologne; Gerhard Grögler, Leverkusen, and Holger Meyborg, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 24, 1981, Ser. No. 286,419
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1980, 3029922
Int. Cl.³ C08G 18/32
U.S. Cl. 521—149 11 Claims

1. A process for the preparation of a polymer precursor containing an oxazolin-2-one ring which forms a high molecular weight polymer upon heating comprising reacting:

(a) an amino-reactive group containing compound having at least two groups capable of entering into an addition or condensation reaction with primary or secondary aromatically bound amino groups with

(b) an aromatic amine having

(i) at least one primary or secondary aromatically-bound amino group and

(ii) at least one condensed oxazolin-2-one ring

in a quantity such that for each aromatically bound primary or secondary amino group there are from 0.95 to 5 groups present in the amino-reactive group containing compound which are capable of reacting with the amino group.

4,350,782

AQUEOUS PLASTIC DISPERSION, A PROCESS FOR ITS PREPARATION, ITS USE AND A SHEET PREPARED FROM THE PLASTIC DISPERSION

Manfred Küchler, Oberursel; Günther Duve, and Joachim Ebigt, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 15, 1981, Ser. No. 302,400

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1980, 3034949

Int. Cl.³ C08L *31/04*

U.S. Cl. 523—334 7 Claims

1. An aqueous plastic dispersion based on several different vinyl polymers, which contains (a) 4 to 54 percent by weight of a copolymer of a vinyl ester of a monocarboxylic acid and an alkyl acrylate with a glass transition temperature of at most −10° C., (b) 4 to 54 percent by weight of a copolymer of a vinyl ester of a monocarboxylic acid and an acrylate with a glass transition temperature of from 0° to 20° C., (c) 2 to 52 percent by weight of a homopolymer of a vinyl ester of a monocarboxylic acid with a glass transition temperature greater than 20° C. and (d) 10 to 80 percent by weight of a fibrous material, the quantity of the component (d) being relative to the sum of the polymers (a), (b) and (c).

4,350,783

MINE BOLT COMPOSITION

Dean W. Talbot, Coshocton, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 16, 1981, Ser. No. 254,786

Int. Cl.³ C08L *67/06*

U.S. Cl. 523—505 10 Claims

1. A resin composition adapted to maintain the rigidity of an encapsulated system, said composition comprising:

(a) an unsaturated polyester resin composition;

(b) from about 100 to about 400 parts by weight per 100 parts by weight of (a), (c) and (d) of calcium carbonate;

(c) from about 0.1 to about 1.0 part by weight per 100 parts by weight of the total composition of a relatively weak acid which is capable of reacting with calcium carbonate in the presence of water to generate carbon dioxide; and

(d) about 1 part by weight per 100 parts by weight of the total composition of water.

6. An encapsulated multicompartment system for mine roof bolting containing in one compartment a resin composition as defined in claim 1 and sufficient carbon dioxide generated in situ to provide internal rigidity in the compartment, and containing in a second compartment an organic hardener or catalyst reactive with said resin composition.

4,350,784

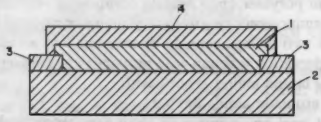
LASER TRIMMABLE RESISTOR COATING

Karl F. Baum, Milwaukee, Wis., assignor to North American Philips Corporation, New York, N.Y.

Filed May 5, 1981, Ser. No. 260,561

Int. Cl.³ C08K *5/06*

U.S. Cl. 524—759 9 Claims



1. For use as a heat cureable coating for forming an abrasive resistance protective coating for laser trimmable resistor devices, a composition consisting essentially of a mixture of a prepolymer selected from the group consisting of a diallyl isophthalate prepolymer and a diallyl phthalate prepolymer, both prepolymers being homopolymers, an ether alcohol solvent, a catalyst selected from the group consisting of t-butyl perbenzoate and t-butyl peroctate and an inert inorganic pigment.

4,350,785

SILICA-CONTAINING PROTECTIVE ADHESIVE PASTE FOR USE WITH OSTOMY APPLIANCES

Wagdi W. Habib, Roselle, Ill., assignor to Hollister Incorporated, Libertyville, Ill.

Continuation-in-part of Ser. No. 87,664, Oct. 24, 1979, abandoned. This application May 22, 1981, Ser. No. 266,448

Int. Cl.³ A61F *13/02;* A61L *15/06;* C08L *5/00*

U.S. Cl. 524—55 14 Claims

1. A protective adhesive paste applicable to skin in paste form for use with ostomy appliances which provides increased resistance to urine and intestinal fluids, said paste being composed essentially of a mixture of a water-absorbing particulate hydrocolloid gum and a volatile organic solvent solution of an organic solvent-soluble adhesive film-forming resin, wherein the improvement comprises having present in said paste form 2 to 6% by weight of colloidal silica selected from the class consisting of fumed silica and precipitated silica.

4,350,786

ORGANOSILANE ANTISTATIC AGENTS FOR GLASS-FILLED POLYARYLENE SULFIDES

Jennings P. Blackwell, and Richard R. Towers, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 10, 1981, Ser. No. 300,860

Int. Cl.³ C08L *81/04*

U.S. Cl. 524—263 6 Claims

1. A method for reducing or inhibiting an electrostatic charge build-up in glass-filled polyarylene sulfide which comprises:

adding an organosilane antistatic agent selected from the group consisting of octadecyltriethoxysilane and octyltrichlorosilane to said glass-filled polyarylene sulfide in an amount sufficient to counteract an electrostatic charge build-up produced by an operation on said glass-filled polyarylene sulfide.

4,350,787

THERMOPLASTIC ERASER

Günter Kimpel, Neumarkt, Fed. Rep. of Germany, assignor to J. S. Staedtler, Nuremberg, Fed. Rep. of Germany

Filed Feb. 10, 1981, Ser. No. 233,291

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1980, 3005298

Int. Cl.³ C08K *5/36*

U.S. Cl. 524—302 8 Claims

1. In an eraser composition composed of fillers, a thermoplastic synthetic rubber as the binder, and conventional additives, the improvement which comprises the binder being a styrene-isoprene-styrene block copolymer having a styrene portion of 10 to 20% by weight and further containing 0.5 to 5% by weight polynorbornene.

4,350,788

SYNTHETIC RESIN EMULSION AND ITS USES

Wataru Shimokawa, Hachioji; Yoshiaki Ito, Itami; Koichi Kobayashi, Ibaraki; Katuaki Fukumori, Kashiwa, and Nobukazu Iwase, Tokyo, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 10, 1981, Ser. No. 252,900

Claims priority, application Japan, Sep. 26, 1980, 55-134829

Int. Cl.³ C08K *5/10*

U.S. Cl. 524—309 9 Claims

1. An aqueous emulsion of a synthetic resin containing an acetoacetylated polyvinyl alcohol as a protective colloid,

wherein the acetoacetyl content of the acetoacetylated polyvinyl alcohol is from 0.05 to 15% by mole and the residual acetyl content of the acetoacetylated polyvinyl alcohol is from 0.1 to 15% by mole.

4,350,789

POLYESTER RESINS TOUGHENED WITH VINYL TERMINATED LIQUID POLYMERS

Eugene H. Rowe, Moab, Utah, and Frank H. Howard, Akron, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 28, 1980, Ser. No. 201,108

Int. Cl.³ C08L *63/00, 67/06*

U.S. Cl. 525—31 **10 Claims**

1. Composition of matter comprising a reaction product of an unsaturated polyester resin and a vinyl terminated reactive liquid polymer, amount of said liquid polymer being sufficient to improve toughness in terms of fracture surface energy without flexibilizing said composition and without significantly deteriorating thermal or mechanical properties thereof, said liquid polymer is a reaction product of a functionally terminated reactive liquid polymer and an epoxy compound containing both an epoxy and a vinyl group.

4,350,790

COMPOSITION WITH LATENT REACTIVE CATALYST

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 109,438, Jan. 4, 1980, Pat. No. 4,307,208, This application Sep. 8, 1981, Ser. No. 299,751

Int. Cl.³ C08L *63/00, 61/28, 37/00*

U.S. Cl. 525—110 **15 Claims**

1. A liquid, thermosetting high solids coating composition which (i) cures, at least in part, by reaction between an amine-aldehyde compound and hydroxyl functionality on a film forming component, which hydroxyl functionality is generated in situ during cure of said composition, (ii) is adapted for low temperature bake applications, (iii) contains greater than about 55% by weight of nonvolatile solids, and (iv) exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a monofunctional film forming copolymer bearing pendent epoxy functionality, having a number average molecular weight (M_n) of between about 1,500 and about 10,000 and a glass transition temperature (T_g) of between about −25° C. and about 70° C., said copolymer consisting of between about 10 and about 30 weight percent of monoethylenically unsaturated monomers bearing glycidyl functionality and between about 90 and about 70 weight percent of other monoethylenically unsaturated monomers;

(B) a latent reactive catalyst comprising the reaction product of (i) a monofunctional copolymer bearing pendent epoxy functionality, having a number average molecular weight (M_n) of between about 1,500 and about 10,000 and a glass transition temperature (T_g) of between about −25° C. and about 70° C., said copolymer being prepared from between about 5 and about 30 weight percent of monoethylenically unsaturated monomers bearing glycidyl functionality and between about 70 and about 95 weight percent of other monoethylenically unsaturated monomers; and (ii) a sulfonic acid having the formula

wherein R is selected from linear or branched alkyl groups and aryl groups, said copolymer bearing pendent epoxy functionality and said sulfonic acid being reacted in such amounts that there are between about 0.3 and about 1 acid groups per epoxy in the reaction mixture;

(C) an amine-aldehyde crosslinking agent; and

(D) up to 45 weight percent of hydroxy functional additive having a number average molecular weight (M_n) of between 150 and about 6,000,

said latent reactive catalyst being included in said composition in an amount ranging from between about 1 and about 5 weight percent and said amine-aldehyde crosslinking agent being included in said composition in an amount ranging from about 15 to about 45 weight percent, said weight percents being based on the total weight of (A), (B), (C) and (D).

4,350,791

VINYLPYRROLIDONE POLYMERS, THEIR PREPARATION, THEIR USE IN THE PREPARATION OF PLASMA SUBSTITUTES, AND THE SUBSTITUTES THUS OBTAINED

Ferdinand Straub, Hockenheim; Siegfried Lang, and Eckhard Roske, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 31, 1980, Ser. No. 221,532

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1980, 3001013

Int. Cl.³ C08L *75/12*

U.S. Cl. 525—123 **5 Claims**

1. A vinylpyrrolidone polymer of the general formula

$$[-A-B-]_m-A$$

where

A is a chain of from 8 to about 1,000 vinylpyrrolidone molecules,

B is ethyl 2,6-diisocyanatocaproate and

m is from 1 to 50,

the linkages between A and B being urethane groups formed from the hydroxyl groups on the vinylpyrrolidone chain and from the isocyanate groups.

4,350,792

BLEND OF INTERNALLY PLASTICIZED VINYL CHLORIDE COPOLYMER AND POLYURETHANE ELASTOMER

Jagadish C. Goswami, New City, N.Y., and Shridhar V. Parikh, Anderson, S.C., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 1, 1979, Ser. No. 16,661

Int. Cl.³ C08L *75/06*

U.S. Cl. 525—129 **4 Claims**

1. A film-forming blend containing from about 40% to about 60%, by weight of the blend, of an internally plasticized vinyl chloride copolymer, which copolymer comprises from about 50% to about 85%, by weight, vinyl chloride, from about 3% to about 47%, by weight, of a C_6-C_{10} alkyl acrylate, and from about 47% to about 3%, by weight, of a bis(hydrocarbyl) vinylphosphonate, and from about 5% to about 25%, by weight of the blend, of a thermoplastic polyurethane elastomer to improve the physical properties of a film formed therefrom.

4,350,793

FLAME-RETARDANT COMPOSITION OF POLYPHENYLENE ETHER, POLYSTYRENE RESIN AND POLYPHOSPHONATE

Manfred Schmidt, New Martinsville, W. Va., and Klaus Reinking, Wermelskirchen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 19, 1981, Ser. No. 226,126

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1980, 3002792

Int. Cl.³ C08L *71/04, 85/02*

U.S. Cl. 525—133 **11 Claims**

1. Flame-retardant composition, characterised in that it contains (1) a usually inflammable composition of a polyphenylene ether resin and a polystyrene resin, (2) an optionally branched aromatic thermoplastic polyphosphonate with a number-average molecular weight of $\overline{M}_n$ of 4,000 to 80,000, the

constituent (2) being employed in amounts of 1 to 20 parts by weight per 100 parts by weight of the total mixture of (1) and (2), and (3) small amounts of a plasticising compound.

4,350,794

HIGH-IMPACT POLYAMIDE MOLDING AND EXTRUSION RESIN COMPOSITIONS

Marlowe V. Moncur, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 59,856, Jul. 23, 1979, abandoned. This application Jun. 18, 1980, Ser. No. 160,402

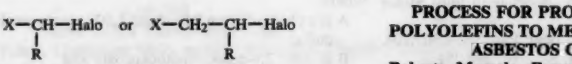
Int. Cl.³ C08L *77/00*

U.S. Cl. 525—183 **21 Claims**

1. The product of the process of melt blending:

(a) from about 50 to about 97% by weight of a polyamide resin derived from (1) the reaction of a dicarboxylic acid or derivative thereof containing from two to twenty carbon atoms with a diamine containing from two to fifteen carbon atoms, or (2) the polymerization of a lactam, and

(b) from about 3 to about 50% by weight of an elastomer which (1) contains from about 5 to about 500 mole equivalents of polyamide reactive chlorine or bromine atoms per 10^6 grams of elastomer, said chlorine or bromine atoms being present in the elastomer in segments of the formula:



wherein,

X is (i) a monovalent radical selected from the group consisting of phenyl, vinyl, carboxy, cyano and nitro, or (ii) a divalent radical selected from the group consisting of oxy, carbonyl, thio, sulfone and corresponding divalent radicals of said (i) radicals;

R is hydrogen or alkyl when X is an (ii) radical, and a divalent radical when X is an (i) radical; and

Halo is the chlorine or bromine; and

(2) has a glass transition temperature of less than 0° C.

4,350,795

THERMOPLASTIC ELASTOMER BLENDS

Georg G. A. Bohm, Akron; Gary R. Hamed, Uniontown, and Lee E. Vescelius, Akron, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 1,623, Jan. 8, 1979, Pat. No. 4,250,273, which is a continuation-in-part of Ser. No. 879,308, Feb. 21, 1978, abandoned, which is a division of Ser. No. 806,036, Jun. 13, 1977, abandoned. This application Aug. 4, 1980, Ser. No. 175,095

Int. Cl.³ C08F *8/00*

U.S. Cl. 525—194 **4 Claims**

1. A process for making a thermoplastic elastomer blend composition, comprising the steps of:

providing a blend of a 1-olefin, a random styrene-butadiene rubber copolymer and a highly saturated elastomer,

the amount of said 1-olefin polymer ranging from about 10 to about 50 parts by weight, the amount of said styrene-butadiene rubber ranging from about 80 to about 15 parts by weight, the amount of said highly saturated elastomer ranging from about 5 to about 55 parts by weight,

said 1-olefin polymer selected from the class consisting of a homopolymer and a copolymer made from 1-olefin monomers having from 2 to about 20 carbon atoms, said homopolymer or said copolymer having a melting point of at least 90° C.,

mixing said blend at a temperature at or above the melting point of said 1-olefin polymer,

partially curing said blend to have a melt flow index of at least 1.0 so that a reprocessable thermoplastic elastomer is produced, and

wherein said highly saturated elastomer is selected from the group consisting of a hydrogenated homopolymer made from dienes from 4 to 10 carbon atoms, and a hydrogenated diblock or triblock copolymer made from conjugated dienes having from 4 to 10 carbon atoms and vinyl substituted aromatics having dienes from 8 to 12 carbon atoms, the amount of said saturation of said elastomer being at least 70%.

4,350,796

OIL-RESISTANT RUBBER COMPOSITION

Motofumi Oyama, Yokosuka, and Kinro Hashimoto, Yokohama, both of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Oct. 16, 1981, Ser. No. 312,101

Claims priority, application Japan, Oct. 20, 1980, 55-146734

Int. Cl.³ C08L *9/02, 47/00*

U.S. Cl. 525—233 **5 Claims**

1. An oil-resistant rubber composition comprising a mixture of (1) a partially hydrogenated elastomer from an unsaturated nitrile monomer and a conjugated diene monomer wherein the degree of hydrogenation of the conjugated diene units is 50 to 98 mole%, and (2) a vinyl chloride resin.

4,350,797

PROCESS FOR PROMOTING THE ADHESION OF POLYOLEFINS TO METALS, GLASS SHEETS, CEMENT, ASBESTOS OR POLAR POLYMERS

Roberto Marzola, Ferrara; Enea Garagnani, Piumazzo, and Alessandro Moro, Pernate, all of Italy, assignors to Montedison S.p.A., Milan, Italy

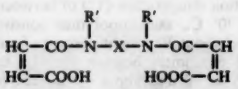
Filed Feb. 26, 1981, Ser. No. 238,463

Claims priority, application Italy, Feb. 28, 1980, 20228 A/80

Int. Cl.³ C08F *255/02, 255/04*

U.S. Cl. 525—293 **13 Claims**

1. Process for promoting the adhesion between polyolefins and metals, glass sheets, cement, asbestos or polar polymers, characterized in that the polyolefin is modified by reaction with 0.01-7% by weight of a modifying agent selected from the group consisting of (1) bismaleamic acids of general formula



wherein X is a group $(CHR)_n$, in which n is an integer from 2 to 18 and R is hydrogen or an alkyl having from 1 to 6 carbon atoms, or X is a bivalent cycloaliphatic or aromatic group, containing one, or more than one, ring or a heterocyclic group; R' is hydrogen, or the two R' together form a $(CHR)_n$ group when X is $(CHR)_n$, (2) the corresponding stereoisomer bisfumaramic acids, (3) alkyl esters of said acids in which the alkyl radical has from 1 to 12 carbon atoms, and (4) the reaction product of a mixture of precursors of said acids or esters; and subsequently heated at the temperature at which the polyolefin is applied onto the material to be adhered thereto.

4,350,798

CHLORINATION OF POLY(VINYL CHLORIDE) IN LIQUID CHLORINE, AND CHLORINATED POLY(VINYL CHLORIDE) COMPOSITION

Richard G. Parker, Hudson, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 26, 1981, Ser. No. 228,538

Int. Cl.³ C08F *8/20*

U.S. Cl. 525—331.6 **6 Claims**

1. A process for photochlorinating poly(vinyl chloride) homopolymer macrogranules to obtain homogeneously chlori-

nated 'chlorinated poly(vinyl chloride)' ("CPVC"), comprising,

(a) suspending said homopolymer having a chlorine content in the range from about 55% to about 57% by weight, in liquid chlorine present in an amount at least 5 times the weight of said homopolymer, for a period of time sufficient to absorb said liquid chlorine into said macrogranules,

(b) swelling said macrogranules at solid-liquid interfaces within and around said macrogranules to produce a gel phase by the action of said liquid chlorine,

(c) photo-illuminating said gel phase until said homopolymer is converted to homogeneously chlorinated CPVC having at least 65% by weight of chlorine, and the mol ratio of PVC present in a sequence of 3 or more vinyl chloride units, to the mols of total vinyl chloride units, is always less than 0.30,

(d) obtaining a solution of said homogeneously chlorinated CPVC in liquid chlorine, and,

(e) recovering solid homogeneously chlorinated CPVC from said solution with halogenated lower alkane.

4,350,799

THERMOPLASTIC TERNARY MOLDING COMPOSITION OF POLYURETHANE POLYPHOSPHONATES AND POLYCARBONATE RESINS

Hans G. Schmelzer, Pittsburgh, Pa.; Manfred Schmidt, New Martinsville, and Robert P. Yeater, Moundsville, both of W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Sep. 16, 1981, Ser. No. 302,890
Int. Cl.[3] C08L 75/06, 75/28, 69/00, 85/02
U.S. Cl. 525—453 10 Claims

1. A well dispersed thermoplastic ternary molding composition comprising polyurethane, polycarbonate and polyphosphonate.

4,350,800

PROCESS FOR THE PREPARATION OF SYNTHETIC RESINS BASED ON RESORCINOL COMPOUNDS

Wolfgang Hesse, Wiesbaden; Franz Landauer, Frankfurt am Main, and Klaus Schmiedel, Königstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 14, 1981, Ser. No. 302,024
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1980, 3034948
Int. Cl.[3] C08G 8/04, 8/20, 8/22, 8/24
U.S. Cl. 525—480 10 Claims

1. A process for the preparation of synthetic resins which comprises reacting a resorcinol pitch which is obtained in the manufacture of resorcinol from benzenedisulfonic acid in at least one step with at least one oxo-compound selected from the group consisting of aldehydes, ketones and compounds based on or splitting off at least one of these substances.

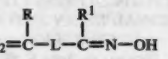
4,350,801

PROCESS FOR PREPARING POLYMERIC OXIMES

Michael J. Grasshoff, Hudson, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 27, 1981, Ser. No. 239,158
Int. Cl.[3] C08F 220/60, 220/34
U.S. Cl. 526—93 31 Claims

1. A process for preparing a polymeric oxime comprising the steps of providing a solution of a monomeric oxime in an aqueous acidic solvent system, said monomeric oxime being of the formula



wherein R is hydrogen or lower alkyl, R^1 is hydrogen, lower alkyl, aryl, aralkyl, or alkaryl, and L is a divalent organic linking group which is stable under the conditions of said process and which does not deleteriously affect the conduct of said process, said solution having a pH of up to about 1.5; and polymerizing said monomeric oxime dissolved in said aqueous acidic solvent system in the presence of an aqueous acid-soluble polymerization initiating agent.

4,350,802

CATALYST SYSTEM FOR POLYMERIZATION OF OLEFINS AND PROCESS FOR PRODUCTION OF POLYOLEFINS USING THE CATALYST SYSTEM

Kazuo Baba; Kizuku Wakatsuki, both of Ichihara, and Tadashi Hikasa, Chiba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 28, 1980, Ser. No. 135,165
Claims priority, application Japan, Apr. 5, 1979, 54/41658
Int. Cl.[3] C08F 4/64, 10/00
U.S. Cl. 526—142 8 Claims

1. A catalyst component for a catalyst system useful for the polymerization of olefins, which comprises a reaction product of (i) a solid organomagnesium compound which is a reaction product of Mg, R—Cl and D in a hydrocarbon solvent, wherein R is an alkyl group having 1 to 20 carbon atoms, D is an ether, and the amount of D is 0.1 to 1.0 mole per 1 gram atom of magnesium, (ii) a phenol compound, (iii) a Lewis base selected from the group consisting of an ether and a carboxylic acid ester, and (iv) titanium tetrahalide, wherein the phenol compound (ii), the Lewis base (iii) and the titanium tetrahalide (iv) are used in an amount of 0.5 to 1.5 moles, 0.05 to 1.0 moles and 2 to 10 moles, respectively, per 1 gram atom of magnesium contained in the organomagnesium compound (i).

4,350,803

REACTION ARRESTMENT MIXER HEAD AND MIXING PROCESS

Laurence R. Penn, Mentor on the Lake, Ohio, assignor to Liquid Control Incorporated, Silver Spring, Md.

Continuation of Ser. No. 107,612, Dec. 27, 1979, abandoned, which is a division of Ser. No. 965,709, Nov. 30, 1978, abandoned. This application Jul. 27, 1981, Ser. No. 286,755
Int. Cl.[3] C08G 85/00
U.S. Cl. 528—10 4 Claims

1. In a process for mixing and then reacting at least two fluid components of the type which when mixed together undergo chemical reaction to form a solid polymeric final reaction product, said process including separately introducing said components into a mixer and therein mixing and reacting said components, and discharging the resultant reaction mixture from said mixer prior to final completion of said chemical reaction and while said reaction mixture is still in a fluid state, the improvement comprising:

cooling said reaction mixture within said mixer to a lowered temperature at which said chemical reaction will be retarded or will not occur, thereby preventing the formation of said solid reaction product within said mixer, and thereafter heating said reaction mixture within said mixer to increase the reaction rate of said chemical reaction.

4,350,804

CURABLE COMPOSITIONS COMPRISING AN AZOLE-FUNCTIONAL RESIN AND A METAL-LIGAND COMPLEX

John S. Ostrowski, Pittsburgh; John F. Grunewalder, Glenshaw, and Nicholas T. Castellucci, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 21, 1980, Ser. No. 208,971
Int. Cl.[3] C08G 59/14, 73/06
U.S. Cl. 525—327.3 15 Claims

1. A curable composition comprising:
(A) an azole-functional resin; and
(B) a labile metal-ligand complex;
wherein said labile metal-ligand complex is capable of reacting with said azole-functional resin.

4. The composition of claim 1 wherein said azole-functional resin comprises the reaction product of
(i) a compound selected from the group consisting of a triazole, a thiadiazole, a tetrazole, an imidazole, and a mixture thereof; and
(ii) a resin capable of reacting with said compound.

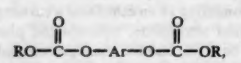
4,350,805

PROCESS FOR THE PREPARATION OF POLY(ESTER-CARBONATES)

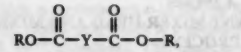
Winston J. Jackson, Jr., Kingsport, Tenn., and William R. Darnell, Weber City, Va., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 17, 1980, Ser. No. 207,817
Int. Cl.[3] C08G 63/64
U.S. Cl. 528—271 5 Claims

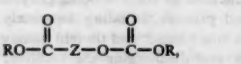
1. Process for preparation of a high molecular weight poly(ester-carbonate) comprising
(a) preparing a reaction mixture of
(1) an aromatic diol bis(alkylcarbonate) (A) having the general formula



wherein R is the same or different and selected from alkyl groups containing 1–8 carbon atoms and Ar is the aromatic residue remaining after removal of hydroxyl groups from an aromatic diol,
(2) 0 to 47.5 mole percent of at least one ester of at least one dicarboxylic acid (B) having the general formula



wherein R is the same or different and selected from alkyl groups containing 1–8 carbon atoms and Y is the residue remaining after removal of the carboxyl groups from an aliphatic, cycloaliphatic or aromatic dicarboxylic acid,
(3) 0 to 80 mole percent of at least one mixed carboxylate-carbonate ester of at least one aromatic hydroxy acid (C) having the general formula



wherein R is the same or different and selected from alkyl groups containing 1–8 carbon atoms and Z is the residue remaining after removal of the hydroxyl and carboxyl groups from meta- or para-oriented aromatic hydroxy carboxylic acids, and
(4) a catalytic amount of an ester exchange and polymerization catalyst,
wherein the molar percentages of (A)+(B)+(C)=100%, the molar percentage of (A) is at least 5 percentile units greater than the molar percentage of (B); the molar percentage of (B) or the molar percentage of (C) may be 0, but the molar percentage of (B)+ the molar percentage of (C) is at least 5% of the total reactants,
(b) heating the reaction mixture to a temperature sufficient to keep the reaction mixture molten and to distill away dialkyl carbonate condensation by-product, and
(c) reducing pressure for a time sufficient to further remove dialkyl carbonate condensation product and to increase the molecular weight of the polymer.

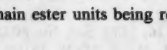
4,350,806

BIOCOMPATIBLE COPOLYMERS

Kenneth B. Wagener, Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

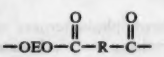
Filed Sep. 28, 1981, Ser. No. 306,110
Int. Cl.[3] C08G 63/44, 69/44, 73/16
U.S. Cl. 528—289 12 Claims

1. A process for making articles which are compatible with biological materials, the improvement comprising forming said articles from a segmented thermoplastic copolyester consisting essentially of a multiplicity of recurring long-chain ester units and short-chain ester units joined head to tail through ester linkages, said long-chain ester units comprising from 30–70% by weight of the copolyester and being represented by the formula:



(I)

and said short-chain ester units being represented by the formula:



(II)

where L in said long-chain unit is a divalent radical remaining after removal of terminal hydroxyl groups from a poly(oxyalkylene) glycol having at least one thermally stable heterocyclic ring per molecule, each of said rings attached to said chain through amide or imide linkages and giving said radical, L, a carbon to nitrogen ratio between about 3/1 and about 350/1, and a number average molecular weight of between 200 and 8,000; R is a divalent radical remaining after removal of carboxyl groups from a dicarboxylic acid having a molecular weight of less than 300; and E in said short-chain unit is a divalent radical remaining after removal of hydroxyl groups from a low molecular weight diol having 2 to 15 carbon atoms per molecule and a molecular weight less than about 250.

4,350,807

COPOLYESTER COMPOSITIONS

Richard L. McConnell; Jimmy R. Trotter, and Glenn C. Jones, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 9, 1981, Ser. No. 232,768
Int. Cl.[3] C08G 3/16
U.S. Cl. 528—302 8 Claims

1. Copolyester derived from
(a) 100 mole % of a dibasic acid component, at least 2 mole % of which is an ethylene telomer ester of ethylene and at least one dialkyl ester of an aliphatic or cycloaliphatic dibasic acid, said dibasic acid containing from 3 to 22 carbon atoms and the alkyl groups of which contain from 1 to 8 carbon atoms, and
(b) 100 mole % of at least one aliphatic or alicyclic glycol having 2 to 12 carbon atoms,
said copolyester having a crystalline melting point of less than 200° C.

4,350,808

COPOLYESTER COMPOSITIONS

Richard L. McConnell; Jimmy R. Trotter, and Glenn C. Jones, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 9, 1981, Ser. No. 232,769
Int. Cl.³ C08G 3/16
U.S. Cl. 528—302 8 Claims

1. Copolyester derived from

(a) 100 mole % of a dibasic acid component, from about 2 mole % to about 30 mole % of which is an ethylene telomer ester of ethylene and at least one dialkyl ester of an aliphatic or cycloaliphatic dibasic acid, said dibasic acid containing from 3 to 22 carbon atoms and the alkyl groups of which contain from 1 to 8 carbon atoms, and

(b) 100 mole % of at least one aliphatic or alicyclic glycol having 2 to 12 carbon atoms,

said copolyester having a crystalline melting point of at least 200° C.

4,350,809

PROCESS FOR THE PREPARATION OF COPOLYMERS CONTAINING HYDROXYL GROUPS

Hannes Fischer, Taunusstein, and Helmut Plum, Übach-Palenberg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 17, 1980, Ser. No. 197,899
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1979, 2942327
Int. Cl.³ C08G 63/06
U.S. Cl. 528—361 6 Claims

1. A process for the preparation of a copolymer containing hydroxy groups formed by reaction of

(A) 10 to 30% by weight of at least one glycidyl ester of an aliphatic saturated monocarboxylic acid having tertiary or quaternary α carbon atom, said glycidyl ester containing in total 12 to 14 carbon atoms; and

(B) 90 to 70% by weight of at least two unsaturated copolymerisable monomers, at least one of which contains at least one carboxyl group,

the weight percentage being based on the total of (A) plus (B) totalling always 100%, comprising first introducing component (A) to a reaction zone and polymerizing without a solvent component (A) with component (B) at 140° to 200° C. in the presence of a radical initiator until a degree of polymerization of the monomers of at least 95% is achieved to obtain a solvent-free, low-viscosity copolymer having free —OH groups and ester groups, component (B) containing at least 3.3% by weight of a monomer having carboxyl groups.

4,350,810

PREPARATION OF BRANCHED CHAIN ARYLENE SULFIDE POLYMER

Dale O. Tieszen, and Lacey E. Scoggins, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 66,584, Aug. 14, 1979, Pat. No. 4,282,347. This application May 8, 1981, Ser. No. 261,863
Int. Cl.³ C08G 75/16
U.S. Cl. 528—388 12 Claims

1. A process for the production of branched polymers of arylene sulfide said process comprising:

(a) contacting under polymerization conditions for a time sufficient to form arylene sulfide polymer a reaction mixture comprising:

(1) at least one p-dihalobenzene;

(2) at least one alkai metal sulfide;

(3) at least one organic amide;

(4) water in an amount of about 1.0 mole to about 2.4 moles per mole of alkali metal sulfide, said amount including water of hydration; and

(5) at least one alkali metal carboxylate, and

(b) contacting under polymerization conditions a polyhaloaromatic compound having more than 2 halogen constituents per molecule with said arylene sulfide polymer formed in said reaction mixture, said contacting of polyhaloaromatic compound in an amount sufficient to produce branched polymer and for a time having a time range of up to about 75 minutes before entering upon termination of the polymerization process.

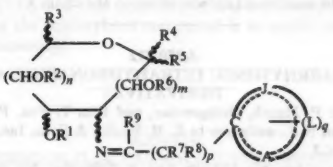
4,350,811

CHIRAL SUGAR COMPLEXES

David Holland, Frodsham, and David J. Milner, Manchester, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 8, 1980, Ser. No. 166,838
Claims priority, application United Kingdom, Jul. 13, 1979, 7924518
Int. Cl.³ C07H 15/12, 17/02, 17/04, 23/00
U.S. Cl. 536—18 9 Claims

1. A metal complex which comprises a metal from the first or second series of the main group of transition metals in co-ordination with a chiral Schiff base of the formula:



wherein

at least the carbon atom of the monosaccharide to which carbon atom the iminyl nitrogen atom is attached is asymmetric,

at least one of the carbon atoms adjacent the said carbon atom bears a hydroxyl group,

R^1 and R^6 which may be the same or different, are hydrogen or lower alkyl,

R^2 is hydrogen or lower alkyl or where n is 1 and R^3 is $—CH_2OR^{10}$, OR^2 and OR^{10} together form an acetal or ketal residue,

R^3 is $—CH_2OR^{10}$ in which R^{10} is hydrogen, lower alkyl or where n is 1, OR^2 and OR^{10} together form an acetal or ketal residue,

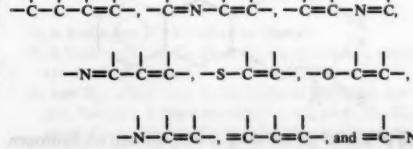
R^4 is hydrogen or $—CH_2OR^{10}$ in which R^{10} is hydrogen, or a lower alkyl,

R^5 is hydrogen or OR^1 provided that both R^4 and R^5 are not hydrogen,

R^7 and R^8, which may be the same or different, are hydrogen, or lower alkyl, or where p is 1, may with the cyclic ring to which CR^7R^8 is attached form a fused system,

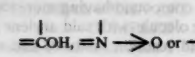
R^9 is hydrogen, alkyl, aralkyl, aryl or alkaryl,

J is a chain of 3 or 4 atoms which chain is chosen from the group consisting of



and with the group C══A forms a substantially planar cyclic conjugated system containing $(4z+2)\pi$ electrons, where z is a positive integer,

A is nitrogen, or



L each of which may be the same or different, represents a substituent attached to a carbon atom in the chain J and is (a) hydrogen, alkyl, aralkyl, aryl, alkaryl, hydroxy, OR^{11}, $OCOR^{11}$, CHO, COR^{11}, CO_2H, CO_2R^{11}, CN, $CONH_2$, NH_2, NHR^{11}, NR^{11}_2, $NHCOR^{11}$, NO_2, SH, SR^{11}, SOR^{11}, SO_3R^{11} and a halogen atom, where R^{11} is alkyl, aralkyl, or aryl, or (b) where p is 0, the L's on two adjacent atoms in the chain J may, together with the ring

form a fused bicyclic system,

m is 0 to 1,

n is 0 or 1, provided that n plus m is 0 or 1

p is 0, 1 or 2, and

q is the number of carbon atoms in the chain J.

4,350,812

ANTIARRHYTHMIC TETRAHYDRONAPHTHALENE DERIVATIVES

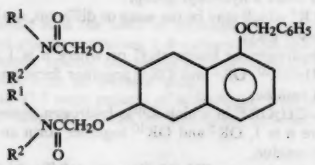
Frederic P. Hauck, Bridgewater, and Rita T. Fox, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 195,685, Oct. 9, 1980, Pat. No. 4,302,453, which is a continuation-in-part of Ser. No. 93,654, Nov. 13, 1979, abandoned. This application Aug. 6, 1981, Ser. No. 290,558

Int. Cl.[3] **C07C** *103/29, 103/85;* **C07D** *265/30*

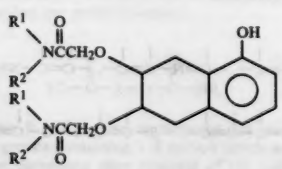
U.S. Cl. 544—79 **8 Claims**

1. A compound having the structure



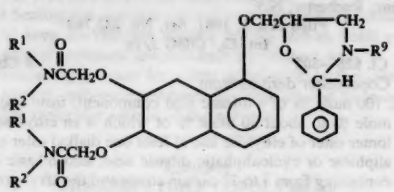
wherein R^1 and R^2 are the same or different and are hydrogen, lower alkyl, lower alkenyl or hydroxy-lower alkyl, or R^1 and R^2 are taken together with the nitrogen atom to which they are attached to form a 5- to 7-membered heterocyclic ring containing one or two heteroatoms, and which may contain in addition to said nitrogen atom, one nitrogen, oxygen or sulfur atom.

5. A compound having the structure



wherein R^1 and R^2 are the same or different and are hydrogen, lower alkyl, lower alkenyl or hydroxy-lower alkyl, or R^1 and R^2 are taken together with the nitrogen atom to which they are attached to form a 5- or 7-membered heterocyclic ring containing one or two heteroatoms, and which may contain in addition to said nitrogen atom, one nitrogen, oxygen or sulfur atom.

8. A compound having the structure



wherein R^1 and R^2 are the same or different and are hydrogen, lower alkyl, lower alkenyl or hydroxy-lower alkyl, or R^1 and R^2 are taken together with the nitrogen atom to which they are attached to form a 5- or 7-membered heterocyclic ring containing one or two heteroatoms, and which may contain in addition to said nitrogen atom, one nitrogen, oxygen or sulfur atom, and R^3 is lower alkyl.

4,350,813

PROCESS FOR PRODUCING 7-ALKOXYCARBONYL-6,8-DIMETHYL-4-HYDROXYMETHYL-1-PHTHALAZONE AND ITS INTERMEDIATES

Yukio Takei, Abiko; Masao Yoshida, Higashikurume, and Rinzo Nishizawa, Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

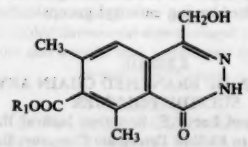
Filed Jul. 23, 1980, Ser. No. 171,363

Claims priority, application Japan, Jul. 31, 1979, 54-96763; Jul. 31, 1979, 54-96764; Dec. 13, 1979, 54-160873

Int. Cl.[3] **C07D** *237/32*

U.S. Cl. 544—237 **4 Claims**

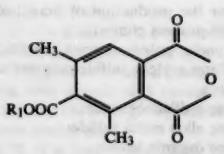
1. A process for producing 7-alkoxycarbonyl-6,8-dimethyl-4-hydroxymethyl-1-phthalazone represented by the following formula:



(VIII)

wherein R_1 is a lower alkyl, which comprises:

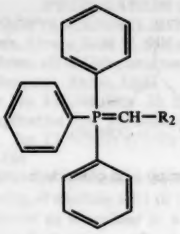
(A) reacting 3,5-dimethyl-4-alkoxycarbonylphthalic anhydride represented by the following formula:



(I)

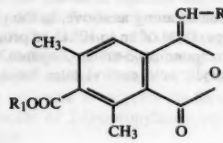
wherein R_1 is as defined above, with a compound represented by the following formula:

(II)



wherein R_2 is —CN, a lower alkoxycarbonyl, an aralkoxycarbonyl or an aryloxycarbonyl to obtain 6-alkoxycarbonyl-5,7-dimethyl-$\Delta^{3\alpha}$-substituted methylenephthalide represented by the following formula:

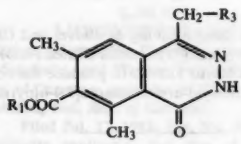
(III)



wherein R_1 and R_2 are as defined above, followed by:

(B) reacting the compound of formula (III) with hydrazine to obtain a compound represented by the following formula

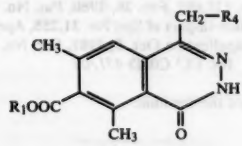
(IV)



wherein R_1 is as defined above and R_3 is —CN or —$CONHNH_2$,

(C) hydrolyzing the compound of formula (IV) to obtain 7-alkoxycarbonyl-6, 8-dimethyl-4-substituted methyl-1-phthalazone represented by the following formula:

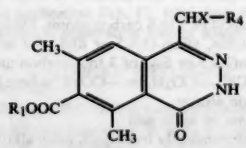
(V)



wherein R_1 is as defined above and R_4 is —$CONH_2$ or —COOH,

(D) halogenating the compound of formula (V) to obtain 7-alkoxycarbonyl-6, 8-dimethyl-4- (α-halogeno-α-substituted methyl)-1-phthalazone represented by the following formula:

(VI)



wherein R_1 and R_4 are as defined above and X is halogen atom, and then

(E) hydrolyzing and in an acidic or neutral condition decarboxylating by heating the compound of formula (VI) by either method of the following methods (a), (b) or (c):

(a) directly hydrolyzing and decarboxylating the compound of formula (VI),

(b) when R_4 in formula (VI) is —COOH, either reacting the compound of formula (VI) with a carboxylic acid salt represented by the following formula:

$$(R_5COO)_nM \qquad \text{(VII)}$$

wherein R_5 is a hydrogen atom, an alkyl, aryl or aralkyl, M is alkali metal or alkaline earth metal, and n is 1 when M is alkali metal while n is 2 when M is alkaline earth metal, and simultaneously decarboxylating by heating the acyloxylated compound in solvent and then hydrolyzing the decarboxylating compound, or firstly decarboxylating by heating the compound of formula (VI) in a solvent, reacting the decarboxylated product with the carboxylic acid salt of formula (VII) and then hydrolyzing the acyloxylated product.

(c) when R_4 in formula (VI) is —$CONH_2$, reacting the compound of formula (VI) with the carboxylic acid salt of formula (VII), and then hydrolyzing and decarboxylating by heating the acyloxylated compound in an acidic condition simultaneously.

4,350,814

PYRROLO [3,4-C]QUINOLINE COMPOUNDS

Howard S. Shapiro, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

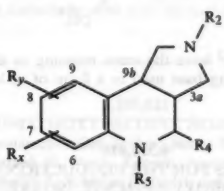
Division of Ser. No. 87,458, Oct. 22, 1979, Pat. No. 4,268,513. This application Jan. 8, 1981, Ser. No. 223,527

Int. Cl.³ C07D *491/14, 491/22*

U.S. Cl. 546—84 **7 Claims**

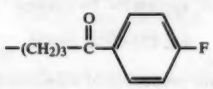
1. A compound selected from the group consisting of hexahydropyrrolo [3,4-c]quinolines of the following formula (I):

(I)



wherein

R_2 is



R_4 is hydrogen, C_1–C_3 alkyl or phenyl;

R_5 is hydrogen, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, acetyl, benzyl or CH_2CF_3, and

R_x and R_y, which may be the same or different, are hydrogen, halogen, trifluoromethyl, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio, hydroxy or cyano, or when R_x and R_y are alkoxy on adjacent carbons, they combine to form a 5-membered methylene dioxy or a 6-membered ethylene dioxy ring, and the pharmaceutically-acceptable acid addition salts thereof.

4,350,815
PROCESS FOR THE PRODUCTION OF 4,6-DIAMINO-5-CYANO-3-ARYL-ISOXAZOLO [5,4-b] PYRIDINES

Hans Junek, and Burkhard Thierrichter, both of Graz, Austria, assignors to Lonza Ltd., Gampel, Switzerland

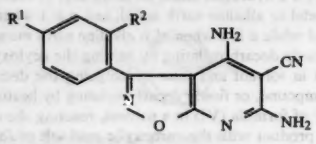
Filed Nov. 21, 1980, Ser. No. 209,150

Claims priority, application Switzerland, Nov. 22, 1979, 10408/79

Int. Cl.³ C07D *498/04*

U.S. Cl. 546—115 **9 Claims**

1. Process for the production of a 4,6-diamino-5-cyano-3-arylisoxazolo [5,4—b] pyridine having the formula:

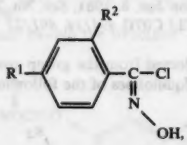


(4)

wherein (a) R^1 and R^2 are —H, or (b) R^1 is —Cl and R^2 is —H, or (c) R^1 is $-CH_3$ and R^2 is —H, or (d) R^1 is $-NO_2$ and R^2 is —H, or (e) R^1 is —H and R^2 is $-NO_2$, comprising reacting 2-amino-1-propane-1,1,3-tricarbonitrile having the formula:

(1)

with a benzohydroxyamino acid chloride having the formula:



(2)

wherein R^1 and R^2 have the same meaning as above, in the presence of a strong base used in a form of at least a molar quantity.

4,350,816
PROCESS FOR THE PRODUCTION OF 4-AMINO-6-HYDROXY-3-PHENYL ISOXAZOLO [5,4-B] PYRIDINE-5-CARBONITRILES

Hans Junek, and Burkhard Thierrichter, both of Graz, Austria, assignors to Lonza Ltd., Gampel, Switzerland

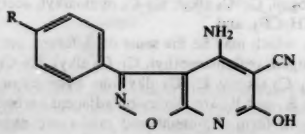
Filed Nov. 21, 1980, Ser. No. 209,149

Claims priority, application Switzerland, Nov. 22, 1979, 10409/79

Int. Cl.³ C07D *498/04*

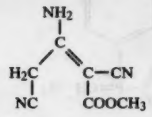
U.S. Cl. 546—116 **8 Claims**

1. Process for the production of 4-amino-6-hydroxyl-3-aryl-isoxazolo[5,4-b]pyridine-5-carbonitrile having the formula:



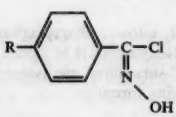
(4)

whereby R (a) is —H, or (b) is —Cl or (c) is $-CH_3$, comprising (A) reacting 3-amino-2,4-dicyanocrotonic acid methyl ester having the formula:



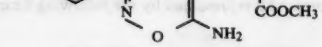
(1)

with a benzohydroxyamino acid chloride having the formula:



(2)

wherein R has the same meaning as above, in the presence of a strong base at a temperature of up to 10° C. to produce, as an intermediate, the corresponding 3-amino-2-cyano-3-(5-amino-3-aryl-isoxazol-4yl)-acrylic acid methyl ester having the formula:



(3)

wherein R has the same meaning as above; and (B) reacting said intermediate product (1) in excess diluted NaOH or KOH at a temperature of 50° to 110° C. to produce the corresponding 4-amino-6-hydroxy-3-aryl-isoxazolo[5,4-b]pyridine-5-carbonitrile.

4,350,817
4-CL, BR OR I-3-CARBOXY OR CYANO-1,2-DIHYDRO-2-OXO-1,8-NAPHTHYRIDINE DERIVATIVES

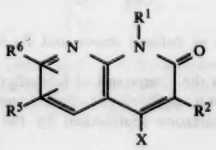
Anthony C. Scotese, King of Prussia, and Arthur A. Santilli, Havertown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 125,600, Feb. 28, 1980, Pat. No. 4,324,893, which is a continuation-in-part of Ser. No. 31,255, Apr. 18, 1979, abandoned. This application Oct. 5, 1981, Ser. No. 308,306

Int. Cl.³ C07D *471/04*

U.S. Cl. 546—122 **7 Claims**

1. A compound of the formula:



in which

R^1 is hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, alken-(3,4,5 or 6)yl of 3 to 6 carbon atoms or alkyn(3,4,5 or 6)yl of 3 to 6 carbon atoms;

R^2 is $-CCl_3$, —CN, $-CO_2H$, or $-CO_2R^7$ where R^7 is alkyl of 1 to 6 carbon atoms;

X is chloro, bromo or iodo; and

R^5 and R^6 are independently hydrogen, halo, alkoxy, of 1 to 6 carbon atoms, or alkyl of 1 to 4 carbon atoms.

4,350,818

PREPARATION OF 2-(ISOPROPYLSULFINYL)BENZOTHIAZOLE

Roger J. Hopper, Akron; Budd H. Sturm, Hartville, and Joseph F. Geiser, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 132,049, Mar. 20, 1980, Pat. No. 4,280,967. This application Jan. 14, 1981, Ser. No. 224,988

Int. Cl.³ C07D *277/76, 277/74*

U.S. Cl. 548—166 1 Claim

1. A process for the synthesis of 2-(isopropylsulfinyl)-benzothiazole consisting of reacting a 1:1 to 1:3 molar ratio of 2-mercaptobenzothiazole to propylene in a pressure vessel in the presence of a catalytic amount of a monomeric or polymeric arenesulfonic acid optionally in the presence of an inert organic solvent and wherein the reaction is conducted at 125°–200° C. for a period of time sufficient to effect the formation of 2-(isopropylthio)-benzothiazole which is isolated, and thereafter reacting the 2-(isopropylthio)-benzothiazole with up to a 30 percent excess of aqueous sodium hypochlorite under conditions of high frequency mechanical homogenization, at 10°–40° C., in the presence of $NaHSO_4$ or $KHSO_4$ and urea, the amount of $NaHSO_4$ or $KHSO_4$ being sufficient to result in a final pH of the reaction mixture of 1.8–4.0, and the amount of urea being sufficient to suppress the formation of more than 5 weight percent of 2-(isopropylsulfonyl)-benzothiazole in the final product.

4,350,819

1-HYDROXYPYRAZOLE

Norbert Rieber, Mannheim; Heinrich Böhm, Neuhofen; Rolf Platz, Mannheim, and Werner Fuchs, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 17, 1981, Ser. No. 284,397

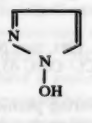
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1980, 3031385

Int. Cl.³ C07D *231/12*

U.S. Cl. 548—375 1 Claim

1. 1-Hydroxypyrazole of the formula

Ia



4,350,820

3,6,6-TRIMETHYLBICYCLO[3.1.0]HEXANE DERIVATIVES AS PYRETHROID INTERMEDIATES

Johannes L. M. Syrier, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 189,982, Sep. 23, 1980, Pat. No. 4,284,820. This application Feb. 17, 1981, Ser. No. 235,182

Claims priority, application United Kingdom, Sep. 28, 1979, 7933836

Int. Cl.³ C07D *303/32*

U.S. Cl. 549—545 1 Claim

1. 3,4-Epoxy-4-formyl-3,6,6-trimethylbicyclo[3.1.0]hexane, having the 1R configuration in which 1 denotes the carbon atom of the cyclopropane ring bonded to the group —C—C(H)=O.

4,350,821

3,6,6-TRIMETHYLBICYCLO[3.1.0]HEXANE DERIVATIVES AS PYRETHROID INTERMEDIATES

Johannes L. M. Syrier, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 189,982, Sep. 23, 1980, Pat. No. 4,284,820. This application Feb. 17, 1981, Ser. No. 235,183

Claims priority, application United Kingdom, Sep. 28, 1979, 7933836

Int. Cl.³ C07D *303/32*

U.S. Cl. 549—545 1 Claim

1. 3,4-Epoxy-4-formyloxy-3,6,6-trimethylbicyclo[3.1.0]hexane, having the 1R configuration in which 1 denotes the carbon atom of the cyclopropane ring bonded to the group —C—O—C(H)=O.

4,350,822

ANTILIPIDEMICPARA-[ARYL(ALKYL OR ALKENYL)AMINO]BENZOIC ACID DERIVATIVES

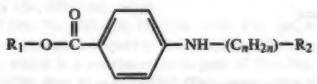
Jay D. Albright, Nanuet; Thomas G. Miner, Chester, and Robert G. Shepherd, South Nyack, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 557,550, Mar. 12, 1975, Pat. No. 4,185,115. This application Mar. 15, 1979, Ser. No. 20,766

Int. Cl.³ C07C *101/60, 101/62;* A61K *31/195, 31/245*

U.S. Cl. 560—45 17 Claims

1. A compound of the formula:



wherein n is an integer from 1 to 16; R_1 is selected from the group consisting of hydrogen and alkyl having from 1 to 6 carbon atoms; R_2 is selected from the group consisting of 4-halophenyl, 2,4-dihalophenyl, 2,4,6-trihalophenyl, 4-benzyloxyphenyl and 4-biphenyl; and the pharmaceutically acceptable acid-addition salts thereof and the alkali metal or organic base carboxylic acid salts thereof when R_1 is hydrogen.

4,350,823

CARBOMETHOXY METHYL NORBORNANES

Philip T. Klemarczyk, Old Bridge; James M. Sanders, Eatontown; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank; Frederick L. Schmitt, Holmdel, and Edward J. Granda, Englishtown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

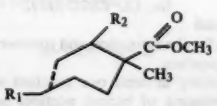
Continuation-in-part of Ser. No. 133,870, Mar. 25, 1980, Pat. No. 4,319,036. This application Jul. 16, 1981, Ser. No. 284,107

The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.

Int. Cl.³ C07C *69/753*

U.S. Cl. 560—120 3 Claims

1. At least one norbornyl compound defined according to the structure:



wherein the dashed lines represents a carbon-carbon single bond or a carbon-carbon double bond and one of R_1 or R_2 is methyl and the other of R_1 or R_2 is hydrogen.

4,350,824
PROCESS FOR THE PREPARATION OF 1,1-DICHLORO-ALKENES

Hans-Jochem Riebel; Fritz Maurer, both of Wuppertal, and Uwe Priesnitz, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

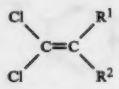
Filed Feb. 23, 1981, Ser. No. 236,484

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 3009486

Int. Cl.³ C07C *21/20, 67/307*

U.S. Cl. 560—124 **10 Claims**

1. A process for the preparation of a 1,1-dichloroalkene of the formula



in which

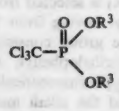
R^1 is hydrogen, or an alkyl, alkenyl, alkinyl, cycloalkyl, aralkyl, aralkenyl or aryl radical, and

R^2 is an alkyl, alkenyl, alkinyl, cycloalkyl, aralkyl, aralkenyl or aryl radical, or

R^1 and R^2 together form an optionally branched and/or optionally benzo-fused hydrocarbon chain,

comprising reacting a carbonyl compound of the formula

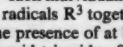
with a trichloromethanephosphonic acid ester of the formula



in which

R^3 each individually is an alkyl or phenyl radical, or the two radicals R^3 together are alkanediyl,

in the presence of at least an equimolar amount of a phosphorous acid triamide of the formula



in which

R^4 each independently is an alkyl radical, or the two radicals R^4 together are alkanediyl.

4,350,825
PROCESS FOR THE MANUFACTURE OF STYRENE

I-Der Huang, West Paterson, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 960,735, Nov. 15, 1978, abandoned, which is a continuation of Ser. No. 755,245, Dec. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 685,057, May 10, 1976, abandoned. This application May 30, 1980, Ser. No. 156,067

Int. Cl.³ C07C *51/12*

U.S. Cl. 562—406 **8 Claims**

1. A process for the formation and recovery of phenyl acetic acid which comprises:

(a) carbonylating at least one reactant selected from the group consisting of benzyl acetate, benzyl propionate, benzylaldehyde, and benzyl alcohol by contacting a liquid reaction mixture comprising at least one of said reactants with a carbon monoxide containing gas under conditions and in a manner sufficient to form liquid phenyl acetic acid, said liquid reaction mixture additionally comprising at least one homogeneous Group VIII element containing catalyst capable of catalyzing said carbonylation reaction, said Group VIII element being selected from the group consisting of Rh, Ir, and mixtures thereof, and at least one halogen containing promoter capable of promoting said catalyzed carbonylation reaction;

(b) recovering said liquid reaction mixture resulting from step (a) containing liquid phenyl acetic acid and cooling said mixture to a temperature sufficient to crystalize said liquid phenyl acetic acid, thereby forming a two phase mixture having a solid phase and a liquid phase, said solid phase containing said crystalyzed phenylacetic acid and said liquid phase containing the remainder of said components in said liquid reaction mixture and sufficient carbonylation catalyst to catalyze the carbonylation reaction of step (a);

(c) separating said liquid and solid phases; and

(d) recycling said separated liquid phase back to liquid reaction mixture of step (a).

4,350,826
PROCESS FOR PREPARING P-HYDROXY PHENYLGLYCINE

Philip N. Edwards, and Michael E. McMenim, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 925,625, Jul. 17, 1978, abandoned. This application Dec. 12, 1980, Ser. No. 215,872

Int. Cl.³ C07C *99/00*

U.S. Cl. 562—444 **12 Claims**

1. A process for the manufacture of p-hydroxyphenylglycine or an N-alkyl or N,N-dialkyl derivative thereof which comprises the reaction of p-hydroxymandelic acid or a salt thereof with ammonia or an alkyl- or dialkylamine or a salt thereof in aqueous solution at a temperature of between 100° and 135° C.

4,350,827
METHOD FOR RECOVERING PURE METAHYDROXYBENZOIC ACID

Walter R. Demler, Hamburg, and Eugene Odin, Williamsville, both of N.Y., assignors to Buffalo Color Corporation, West Paterson, N.J.

Filed Sep. 8, 1981, Ser. No. 300,196

Int. Cl.³ C07C *65/01*

U.S. Cl. 562—475 **10 Claims**

1. A method for recovering purified metahydroxybenzoic acid from crude m-hyroxybenzoic acid alkali metal salt comprising:

(a) dissolving the crude m-hydroxybenzoic acid alkali metal salt in water at a ratio of between about 13 and 20 milliliters of water per gram of pure m-hydroxybenzoic acid alkali metal salt contained in the crude m-hydroxybenzoic acid alkali metal salt;

(b) acidifying the resulting solution to a pH of below 2 with mineral acid to neutralize all alkali metal hydroxide present and convert the m-hydroxybenzoic acid alkali metal salt to free m-hydroxybenzoic acid, the solution, during acidifying, being maintained at a sufficiently high temperature to prevent crystallization of m-hydroxybenzoic acid from the solution;

(c) cooling the solution to and maintaining the solution at from about 0° C. to about 15° C. for a sufficient time for essentially all m-hydroxybenzoic acid to crystallize from the solution; and

(d) separating the resulting m-hydroxybenzoic acid crystals from the solution.

4,350,828

CRYSTALLIZATION OF ISOPHTHALIC ACID

G. Richard Worrell, and Alan R. Hirsig, both of Media, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 164,472, Jun. 30, 1980, abandoned. This application May 18, 1981, Ser. No. 264,776

Int. Cl.³ C07C *51/42, 51/16*

U.S. Cl. 562—486 9 Claims

1. A process for the purification of isophthalic acid produced by the liquid phase, oxygen-containing gas oxidation of meta-xylene, which purification process comprises;

preparing an aqueous acetic acid solvent consisting from about 90 to 98 percent acetic acid and about 2 percent to about 10 percent water;

preparing in a dissolving zone, a hot solution of impure isophthalic acid derived from said oxidation of meta-xylene, said solution being at a temperature within the range from about 190° F. to about 300° F. while maintaining a superatmospheric pressure minimizing the volatilization of said solvent;

directing a feed stream of said hot solution of impure isophthalic acid into a single crystallization zone at a controlled rate, said single crystallization zone containing a slurry of isophthalic acid crystals dispersed in a solution of isophthalic acid in solvent, said crystallization zone being maintained at a pre-determined crystallization temperature selected within the range from 180° F. to 250° F. to promote crystallization of isophthalic acid in said single crystallization zone, the pressure in the crystallization zone being maintained at a pressure low enough that more than half of the solvent content of said feed stream is quickly distilled to promote evaporative crystallization, whereby a slurry comprising purified isophthalic acid is prepared, the solid particles constituting at least 60% of the isophthalic acid content of said slurry, the residence time of the isophthalic acid in said crystallization zone being controlled to be from about 20 to about 120 minutes, said single crystallization zone promoting formation of an acceptable distribution of particle sizes of crystals of purified isophthalic acid;

recirculating a stream of liquid from the crystallization zone, directing such recirculating stream through a, pumping zone and reinjecting said recirculating stream into the crystallization zone in such a manner that throughout most of said crystallization zone there is general uniformity of composition, said recirculating stream being heated in a heating zone to at least partially compensate for the various dissipations of heat from said crystallization zone, and to provide the heat required for significant evaporative crystallization sufficiently complete to provide final product concentration in such single stage crystallization zone;

withdrawing a purified stream from said crystallization zone at a rate correlated with the feed stream rate and volume in said crystallization zone to provide said controlled residence time, said purified stream having at least 60% of its isophthalic acid content as solids suspended as slurried solids in said purified stream, and subjecting said withdrawn purified stream to separation by centrifugation or filtration to provide a stream of filtrate containing dissolved impurities and residual isophthalic acid and an acceptable yield of purified filter cake consisting of crystalline particles of isophthalic acid; and

recovering purified isophthalic acid having an acceptable distribution of particle sizes from said purified filter cake.

4,350,829

PROCESS FOR PREPARING ISOBUTYRIC ACID

Tatsuo Masuko; Shigeo Fukaya; Nobuyuki Murai, all of Yokkaichi, and Jun Noma, Isshi, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed Jun. 27, 1979, Ser. No. 52,590

Claims priority, application Japan, Jul. 14, 1978, 53-85834; Jul. 14, 1978, 53-85835; Jul. 14, 1978, 53-85836; Jul. 21, 1978, 53-89125; Jul. 21, 1978, 53-89126

Int. Cl.³ C07C *51/235, 51/295, 53/124*

U.S. Cl. 562—531 2 Claims

1. In a process for preparing isobutyric acid by continuous liquid-phase oxidation of isobutyraldehyde with molecular oxygen or a molecular oxygen-containing gas in the presence of an alkali metal-containing compound, the improvement comprising maintaining the molar ratio of oxygen to isobutyraldehyde to be fed at 0.5 or above wherein the oxygen concentration of the reactor off-gas is between 1 percent by volume and the lower explosion limit, the water content of the reaction solution is maintained at 2.5 percent by weight or below and the amount of alkali metal containing compound is 0.01 to 1 mole per liter of reaction solution.

4,350,830

METHOD FOR MAKING ACRYLIC ACID FROM ACROLEIN

David L. Childress, Angleton; William V. Hayes, Clute, and Richard L. Poppe, Clute, all of Tex., assignors to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 955,045, Oct. 26, 1978, Pat. No. 4,208,306, which is a continuation-in-part of Ser. No. 773,992, Mar. 3, 1977, abandoned, which is a continuation-in-part of Ser. No. 678,274, Apr. 19, 1976, Pat. No. 4,035,262. This application Oct. 17, 1979, Ser. No. 85,568

Int. Cl.³ C07C *51/25, 57/055*

U.S. Cl. 562—535 2 Claims

1. In a process for the oxidation of acrolein in the vapor phase to make acrylic acid by reacting acrolein and oxygen wherein a supported catalyst is employed the improvement which comprises employing a catalyst consisting essentially of oxides of molybdenum, vanadium, chromium, copper, titanium and silicon wherein the metals are present in the atomic ratios of

$$Mo_{15}V_{5\text{-}10}Cr_{0.2\text{-}2}Cu_{2\text{-}5}Ti_{1\text{-}3}Si_{1\text{-}5}.$$

4,350,831

MITICIDAL AND MITE OVICIDAL, COMPOUNDS

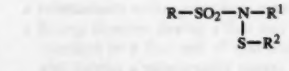
David C. K. Chan, San Francisco, and Arthur A. Whipp, Walnut Creek, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 74,358, Sep. 10, 1979, Pat. No. 4,269,856, which is a continuation of Ser. No. 912,166, Jun. 2, 1978, Pat. No. 4,208,348, which is a division of Ser. No. 760,042, Jan. 17, 1977, Pat. No. 4,107,332. This application Oct. 27, 1980, Ser. No. 201,640

Int. Cl.³ C07C *143/72, 143/84*

U.S. Cl. 564—80 1 Claim

1. A compound of the formula:



wherein one R or R^1 group is cycloalkyl of 5 to 8 carbon atoms substituted with up to 2 alkyl of 1 to 4 carbon atoms or alkenyl of 3 to 6 carbon atoms and the other R or R^1 group is alkyl of 1 to 6 carbon atoms, and R^2 is tetrachloroethyl.

4,350,832

SYNTHESIS OF N-T-BUTYL-P-MENTHANE-3-CARBOXAMIDE

Thomas V. Van Auken, Richmond, Va., assignor to Philip Morris, Incorporated, New York, N.Y.

Filed Apr. 27, 1981, Ser. No. 258,207
Int. Cl.³ C07C *103/737*
U.S. Cl. 564—123 5 Claims

1. A process for the synthesis of N-t-butyl-p-menthane-3-carboxamide which comprises (1) reacting 3-p-menthyl halide with magnesium in an anhydrous solvent medium to form 3-p-menthylmagnesium halide; and (2) reacting the 3-p-menthylmagnesium halide with t-butyl isocyanate at a temperature between about −10° C. and 100° C. to form N-t-butyl-p-menthane-3-carboxamide product.

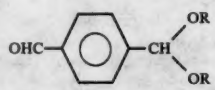
4,350,833

TEREPHTHALDIALDEHYDE MONOACETAL AND METHOD FOR MANUFACTURE THEREOF

Kunihiro Ichimura, 306-302, Matsushiro 3 chome, Yatabemachi, Tsukuba-gun, Ibaragi-ken, Japan

Filed Jan. 28, 1981, Ser. No. 229,076
Claims priority, application Japan, Mar. 29, 1980, 55/40958
Int. Cl.³ C07C *47/548, 45/61*
U.S. Cl. 568—433 7 Claims

1. A terephthaldialdehyde monoacetal represented by the general formula:



wherein R denotes a lower alkyl group.

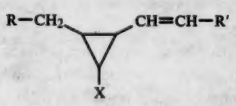
4,350,834

VINYL CYCLOPROPYL COMPOUNDS AS PRECURSORS TO FATTY ACID OXIDATION PRODUCTS

Ned A. Porter; Carl B. Ziegler, Jr., and David H. Roberts, all of Durham, N.C., assignors to Duke University, Durham, N.C.

Filed Aug. 27, 1980, Ser. No. 181,833
Int. Cl.³ C07C *179/02*
U.S. Cl. 568—568 9 Claims

1. A method of synthesizing a nucleophile substituted unsaturated hydrocarbon based compound comprising: reacting a compound of the formula:



wherein R and R′ are hydrogen, alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, aralkyl, alkoxyalkyl, alkoxy, alkylthioalkyl, carboxyalkyl, carboxyalkenyl, and X is a leaving group selected from the group consisting of chlorine, bromine, and iodine with a nucleophilic Ag^+ salt/H_2O_2 reagent.

4,350,835

PROCESS FOR CONVERTING ETHANE TO AROMATICS OVER GALLIUM-ACTIVATED ZEOLITE

Arthur W. Chester, and Yung F. Chu, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 19, 1981, Ser. No. 235,777
Int. Cl.³ C07C *12/02, 12/42*
U.S. Cl. 585—415 15 Claims

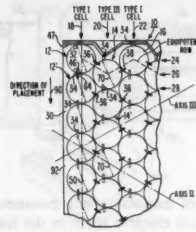
1. A process for producing aromatic compounds which comprises contacting under conversion conditions, a gaseous paraffinic hydrocarbon feed containing ethane, with a catalyst comprising gallium and a crystalline zeolite characterized by a constraint index within the approximate range of 1 to 12 and a silica to alumina ratio of at least 12, the weight of gallium in said catalyst being between about 0.05 to about 10 percent based on the total weight of catalyst whereby ethane present in said gaseous feed is converted to aromatic compounds, and recovering said aromatic compounds as liquids.

4,350,836

SOLAR ARRAY CONSTRUCTION

Marvin S. Crouthamel, Pennsauken, and Peter J. Coyle, Oaklyn, both of N.J., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 14, 1980, Ser. No. 196,273
Int. Cl.[3] H01L *31/04, 31/18*
U.S. Cl. 136—244 10 Claims



1. A solar array construction comprising:

a first plurality of spaced columns of solar cell circular wafers having first and second surfaces of opposite conductivity, the centers of the cells being aligned in the columns in first parallel axes and in rows in second parallel axes;

a second plurality of spaced columns of solar cell circular wafers having first and second surfaces of opposite conductivity, the centers of the cells being aligned in columns in axes parallel to said first axes and in rows parallel to said second axes, the row axes of said second plurality of spaced wafers being spaced about midway between said second axes; and

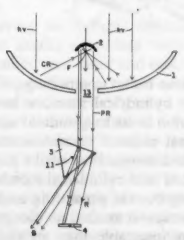
interconnect means for connecting the wafers in each column in series, and the wafers in each row, comprising one wafer in each column, in parallel, the radiation receiving surface of said cell wafers facing in the same direction, said interconnected means comprising a plurality of separate, discrete interconnected tabs arranged in three groups aligned parallel to three corresponding intersecting axes.

4,350,837

SPECTROVOLTAIC SOLAR ENERGY CONVERSION SYSTEM

Stephan R. Clark, 13811 Crested Pt., San Antonio, Tex. 78217

Filed Feb. 11, 1981, Ser. No. 233,465
Int. Cl.[3] H01C *31/04*
U.S. Cl. 136—246 9 Claims



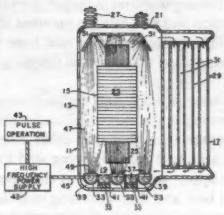
9. A spectrovoltaic energy conversion system comprising a refracting and wavelength dispersing medium variably placed in the path of photons directed from a concentrating or focusing device causing selective spectral dispersion of said photons onto a photovoltaic cell array whereby said variable placement will be achieved by a relative change in the attitude and/or distance of the refracting medium to the photovoltaic material to insure maximum power from the temperature dependent photovoltaic material by maintaining an optimal temperature and optimal number and mix of photons under varying levels of irradiance intensity.

4,350,838

ULTRASONIC FLUID-ATOMIZING COOLED POWER TRANSFORMER

Ronald T. Harrold, Murrysville, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 27, 1980, Ser. No. 163,902
Int. Cl.[3] H01F *27/10*
U.S. Cl. 174—15 R 11 Claims



1. A vaporization-cooled electrical apparatus comprising:

a housing forming a sealed chamber;

a heat-producing electrical member disposed within the chamber;

a quantity of dielectric fluid within the chamber and vaporizable within the normal operating temperature range of said member; and

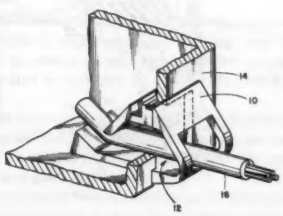
means for applying ultrasonic vibrations at the quantity of dielectric fluid such that the fluid atomizes and contacts the heat producing member.

4,350,839

CABLE LOCK FOR ELECTRICAL OUTLET BOX

John L. Lass, Homewood, Ill., assignor to Square D Company, Palatine, Ill.

Filed Jul. 18, 1980, Ser. No. 170,306
Int. Cl.[3] H02G *3/18*
U.S. Cl. 174—65 G 6 Claims



3. A cable locking device comprising:

an electrical outlet box having one or more substantially rectangular openings in its walls or bottom;

an electrical cable inserted through one of the openings;

a substantially rectangular base portion;

a flexing member having a first end of said flexing member attached to a first end of said base, said flexing member also having a substantially square aperture receiving said electrical cable;

a locking section attached to a second end of said flexing member, said locking section having at least one horizon-

tal groove in its uppermost section for engaging a portion of the wall of the opening in the electrical outlet box;

a cable engaging portion extending downward from said locking section toward said base; and

a cable deflection ramp attached to a second end of said base, said cable deflection ramp cooperating with said cable engaging portion to lock the cable into position within the cable locking device;

wherein said cable locking device fits into the substantially rectangular opening in the electrical outlet box, said base contacting the bottom of the opening of the electrical outlet box and the horizontal groove in the locking section receiving the upper portion of the opening in the electrical outlet box and the flexing member contacting the outer wall of the electrical outlet box;

wherein said flexing member is larger than said base and said locking section and said flexing member contacts the outer wall of the electrical box after said base and said locking section have passed through the opening of the electrical outlet box,

wherein said base portion and locking section are inserted into the opening in the electrical outlet box by flexing said flexing member such that said cable engaging portion is moved towards said base allowing said locking section to pass by the upper wall portion of the opening in the electrical outlet box, and then allowing said flexing member to assume its original position after insertion in the opening in the electrical box, thereby engaging said horizontal groove in said locking section with the upper wall of the opening in the electrical outlet box and said base engaging the bottom of the opening in the electrical outlet box, and

also wherein said cable locking device locks the electrical cable in position when the electrical cable is inserted through said cable receiving aperture and is deflected by said cable deflection ramp and engaged by said cable engaging portion, thereby preventing movement of said cable out of the electrical box.

4,350,840

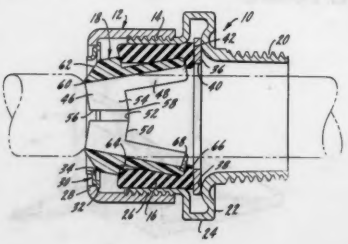
CORD GRIP

Leonard H. Michaels, Warrenville, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Filed Mar. 20, 1981, Ser. No. 246,030

Int. Cl.³ H02G 3/22

U.S. Cl. 174—65 SS **37 Claims**



1. In a cord grip, a variable volume compression chamber defined by two interfitting parts screw threaded together and having a cord passage therethrough, a generally annular grommet in the compression chamber made of a flexible material having the general characteristics of rubber as to compressibility and distortability, a plurality of separate gripper elements having forward gripping areas disposed about the annular grommet and having opposed inner surfaces adapted to cause a rocking motion of the gripper elements when the volume of the compression chamber is axially reduced thereby causing the forward gripping areas to close on the cord disposed through the grommet.

4,350,841

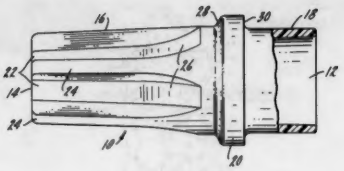
ELECTRICAL CONNECTOR

William J. Scott, Sycamore, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Continuation of Ser. No. 936,589, Aug. 24, 1978, abandoned. This application Dec. 31, 1979, Ser. No. 108,597

Int. Cl.³ H01R 4/22

U.S. Cl. 174—87 **7 Claims**



1. In an article of manufacture, a connector for joining the ends of two or more electric wires in the form of a cap made of an insulating material and having a generally central bore open at one end and closed by an end wall at the other end, the exterior of the cap being provided with a shoulder intermediate the ends thereof facing toward the open end of the cap, the shoulder dividing the exterior of the cap generally into two areas, one toward the closed end of the cap and the other toward the open end, the one area having an irregular surface formation to enable the cap to be grasped and turned down on the wires, and the other area being generally cylindrical and of substantial axial extent.

4,350,842

CABLE SLEEVE OUTLET FOR SPLICE CASE

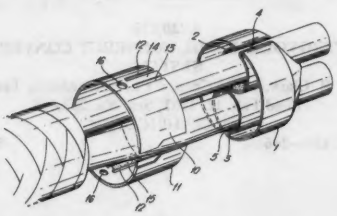
Jean-Marie E. Nolf, Hammemille, Belgium, assignor to N.V. Raychem S.A., Belgium

Filed Aug. 6, 1980, Ser. No. 175,693

Claims priority, application United Kingdom, Aug. 7, 1979, 7927528

Int. Cl.³ H01R 4/00; H02G 13/06

U.S. Cl. 174—92 **17 Claims**



1. A cable sleeve outlet comprising:

a substantially cylindrical member having at least one re-entrant portion in its longitudinal wall shaped to provide a longitudinal channel communicating with the exterior surface of said longitudinal wall a longitudinal opening to the exterior of said cylindrical member to form a longitudinal opening therein permitting each said re-entrant portion to be wrapped around an elongate object; and,

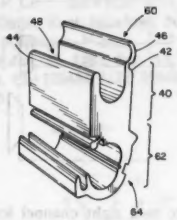
support means insertable into an end of said cylindrical member, said support means being so formed that in use it bears against the inner surface of said longitudinal well to provide a substantially rigid internal support for at least part of said longitudinal wall of said cylindrical member, said support means including a bridging portion corresponding to each said longitudinal opening and in use lying across each said longitudinal opening to bridge and hold closed each said longitudinal opening.

4,350,843

METHOD AND SYSTEM FOR CRIMPING A METAL CONNECTOR

Paul K. Campbell, and Edward L. Nichols, III, both of Birmingham, Ala., assignors to Square D Company, Palatine, Ill.

Filed Aug. 31, 1978, Ser. No. 938,744
The portion of the term of this patent subsequent to Aug. 21, 1996, has been disclaimed.
Int. Cl.³ H01R 5/08
U.S. Cl. 174—94 R 1 Claim



1. An elongated malleable metal connector for electrically and mechanically connecting two cables or the like and for use with a crimping tool having first and second opposed pairs of crimping dies, said connector comprising:

a U-shaped main portion having two legs, a first leg of said two legs having a hinged segment for closing the opening created by the U-shape of said main portion, said hinged segment initially being open, said hinge segment being manually closed after transverse insertion of one of a number of different size cables, and

a tap portion capable of being deformed to a semi-cruciform transverse cross-section with offset cable lodgment and for receiving one of a number of different size cables, said tap portion being attached to said main portion along the bottom of said U-shaped main portion, the axis of said tap portion being parallel to the axis of said main portion, said tap portion including a bifurcated body member having first and second leg portions, the outer surface of said first leg portion being attached to the bottom of said U-shaped main portion, said first and second leg portions being initially connected by a reduced cross-sectional thickness portion of said body member to provide a plastically flowable hinge connection, said first and second leg portions defining an initial predetermined angle such that said body member can laterally engage an uninsulated section of an electrical cable;

said first leg having on the end opposite said reduced thickness portion an axially extending rib member and axially extending inner and outer ridges disposed on either side of said rib member;

said second leg having on the end opposite said reduced thickness portion axially extending inner and outer fingers, said rib member, said inner and outer ridges and said inner and outer fingers being oriented such that said outer finger lies between said outer ridge and said rib member, and said inner finger lies between said inner ridge and said rib member, when said body member is closed about an uninsulated section of the cable, said enclosure occuring by pivoting of said legs about said reduced thickness portion in response to hand applied external pressure; and

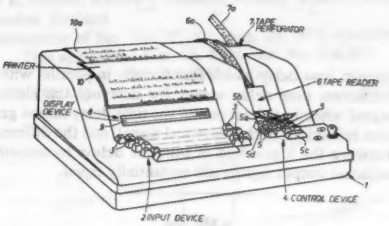
whereby, said inner and outer fingers and said rib members are deformed to form a positive mechanical lock when said connector is placed between the first and second opposed pairs of crimping dies, and said dies are moved simultaneously converging radially toward one another, said first pair, each having a nose portion, bites into said tap portion of said connector and one of said second pair, having a nose portion, also bites into said tap portion of said connector, and the other of said second pair, having a nest die, crimps and main portion of said connector.

4,350,844

ENCIPERING- AND DECIPHERING APPARATUS IN THE FORM OF A TYPEWRITER

Oskar E. Stürzinger, Baar, and Peter Frutiger, Wangen, both of Switzerland, assignors to Anstalt Europaische Handelsgesellschaft, Liechtenstein

Filed Nov. 19, 1976, Ser. No. 743,130
Claims priority, application Switzerland, Nov. 20, 1975, 15063/75
Int. Cl.³ H04L 9/02
U.S. Cl. 178—22.18 13 Claims



1. An enciphering and deciphering apparatus operable in at least a key character storage mode, a plain text mode, an enciphering mode, and a deciphering mode, said apparatus substantially in the form of a typewriter and comprising:

(A) a first keyboard for permitting an operator to enter both text and key character to be processed;

(B) a second keyboard for permitting an operator to enter control commands which determine the mode of operation of said apparatus;

(C) output means including at least one page printer;

(D) a cipher computer and a key character storage associated therewith, said cipher computer for enciphering and deciphering characters applied thereto when said apparatus is operating in said enciphering and deciphering modes, respectively, said cipher computer to encipher and decipher said characters applied thereto in accordance with at least one key character stored in said key character storage;

(E) display means for displaying said entered text and key characters in a progressive stepwise manner; and

(F) central control unit means responsive to said control commands for operating said apparatus in the mode determined by said control commands, said central control unit means to:

(1) cause said entered key characters to be displayed by said display means in said progressive stepwise manner and to thereafter be stored in said key character storage when said apparatus is operated in said key character storage mode;

(2) cause said entered text characters to be displayed by said display means in said progressive stepwise manner and to thereafter be printed by said printer when said apparatus is operated in a plain text mode; and

(3) cause said entered text characters to be displayed by said display means in said progressive stepwise manner and to thereafter be enciphered by said cipher computer and finally printed by said printer when said apparatus is operated in said enciphering mode.

4,350,845

REVERBERATION APPARATUS

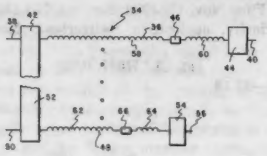
William H. Hall, Dallas, and John R. Saul, Arlington, both of Tex., assignors to Micmix Audio Products, Inc., Dallas, Tex.

Filed Oct. 10, 1979, Ser. No. 83,360
Int. Cl.³ G10H 1/04
U.S. Cl. 179—1 J 18 Claims

15. An apparatus having N time delay means, N being at

least two, for providing simulated reverberation of an electrical signal representative of sound, comprising in combination:

maximum time delay means for delaying the electrical signal; and



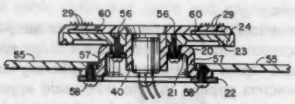
minimum time delay means functionally in parallel with the maximum time delay means for delaying the electrical signal wherein at least one of the time delay means generates reflections of the electrical signal, and the differences between the logarithms of the time delays to temporally adjacent output signals are sustantially equal.

4,350,846

ACOUSTIC MOUNTING AND COUPLER FOR A TELEPHONE HANDSET

Alan C. Busche, Dorchester, and Karlo B. Simonsen, London, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 4, 1980, Ser. No. 203,990
Int. Cl.³ H04M *1/14*
U.S. Cl. 179—1 C **10 Claims**



1. An acoustic mounting and coupler for a telephone handset, comprising:

a tubular flexible resilient member including a central hollow boss for reception of a transducer therein and an annular flange extending outwardly from the boss, the flange having an inner portion extending outwards, a central portion extending parallel to the boss from an outer edge of said inner portion and an outer portion extending outwards from said central portion;

means for attaching said outer portion of said annular flange to a support member, said tubular member extending through an aperture in said support member;

a substantially rigid plate attached to said inner portion of said annular flange and extending over said support member and presenting an upper surface facing away from said support member;

a flexible disc mounted on said plate, and including a plurality of annular flexible members on an upper surface;

said plate and said disc each having a central aperture aligned with said hollow boss of said tubular flexible member.

4,350,847

SUBWOOFER SYSTEM USING A PASSIVE RADIATOR

Matthew S. Polk, Baltimore, Md., assignor to Polk Audio, Inc., Baltimore, Md.

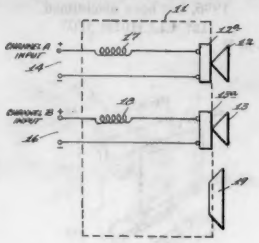
Filed Jan. 12, 1981, Ser. No. 224,451
Int. Cl.³ H04R *5/02*; H04S *1/00*
U.S. Cl. 179—1 GA **5 Claims**

1. A loudspeaker apparatus for use in a stereo sound reproducing system having a left channel signal and a right channel signal comprising

a housing containing an air mass,

a left channel loudspeaker and a right channel loudspeaker mounted in said housing, each of said left and right channel loudspeakers having voice coils,

respective means for connecting the left channel signal to said left channel loudspeaker voice coil and the right



channel signal to said right channel loudspeaker voice coil,

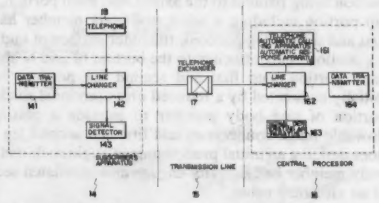
a passive radiator loudspeaker mounted in said enclosure and acoustically coupled by the air mass to said left and right channel loudspeakers for acoustically summing their acoustic outputs.

4,350,848

DATA TRANSMISSION SYSTEM

Masatane Kariya, and Akimori Tomizawa, both of Toda, Japan, assignors to Clarion Company, Ltd., Tokyo, Japan

Filed Jun. 9, 1980, Ser. No. 157,389
Claims priority, application Japan, Jun. 15, 1979, 54-75433
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2 DP **4 Claims**



1. A data transmission system which comprises:

a plurality of subscribers' equipment;

a single central equipment; and

a plurality of telephone lines each interconnecting said subscribers' equipment and said central equipment;

said subscribers' equipment each being comprised of a telephone set, a data transmitter, a signal detector, a manual switch and a line changer for selectively connecting the telephone set, data transmitter and signal detector thereof to the telephone line associated therewith;

said manual switch being connected between said line changer and said signal detector;

said telephone set being normally connected to the telephone line through said line changer to call the central equipment when data transmission is required from the data transmitter to the central equipment;

said signal detector being connected to the telephone line through said line changer and said manual switch;

said central equipment being responsive to a call from said telephone set to provide an announcement thereto and including a signal generator for providing a control signal;

said signal detector including means for detecting the con-

trol signal from said central equipment when said manual switch is operated by the subscriber and producing a line switching signal;

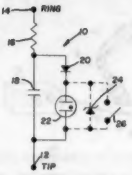
said line changer including means for switching said telephone line from said telephone set and signal detector to said data transmitter in response to the line switching signal.

4,350,849

VARYING IMPEDANCE LINE TEST TERMINATION DEVICE

Omprakash G. Ahuja, East Meadow, N.Y., assignor to TII Industries Inc., Copiague, N.Y.

Filed Jan. 15, 1981, Ser. No. 224,914
Int. Cl.³ H04M *3/22;* H04B *3/46*
U.S. Cl. 179—175 11 Claims



1. A varying impedance line test termination device for providing a characteristic signature to the telephone central office when a continuity test is made on a subscriber line having a pair of electrically conductive paths comprising:

(a) a first current path having a first resistor and a capacitor connected in series, said serially connected first resistor and capacitor being connected across said electrically conductive line paths; and

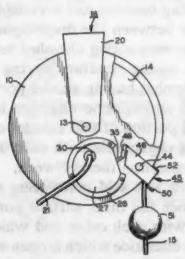
(b) a second current path having a diode and a voltage breakover device connected in series, said serially connected diode and voltage breakover device being connected across said capacitor.

4,350,850

SELF-SWITCHING ELECTRIC CORD REEL

James W. Kovacik; James D. Kovacik, both of Parma; Thomas J. Blanch, Aurora, and Paul S. Blanch, Garfield Heights, all of Ohio, assignors to Alert Stamping & Manufacturing Company, Inc., Bedford Heights, Ohio

Filed Jul. 14, 1980, Ser. No. 168,597
Int. Cl.³ H02G *11/00*
U.S. Cl. 191—12.2 R 10 Claims



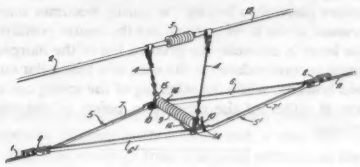
1. A self-switching electric cord reel comprising a housing, a reel rotationally mounted in the housing and containing an electric cord, said housing having an opening through which to pass said electric cord, a switch carried with respect to the housing and electrically serially connected with said electric cord to energize and de-energize the cord, lever means pivotally mounted with respect to said housing and having one arm portion extending across said housing opening and another arm portion adapted to operate said switch upon pivoting, means on said electric cord for pivoting said lever means as said cord travels lengthwise, and mechanical shock-absorbing means on said lever means adapted to strike said housing upon pivoting of said lever means sufficient to operate said switch, thereby to absorb the mechanical shock of said pivoting movement preferentially to said switch.

4,350,851

OVERHEAD ELECTRIC TRACTION SYSTEMS

Alan E. Seddon, Rainford, England, assignor to BICC Limited, London, England

Continuation of Ser. No. 937,811, Aug. 29, 1978, abandoned.
This application Dec. 15, 1980, Ser. No. 216,210
Int. Cl.³ B60M *1/18*
U.S. Cl. 191—39 8 Claims



1. Fabricated equipment of an overhead electric traction system in the form of a section insulator in which the contact wires of two neighbouring sections of the system are mechanically connected together but electrically insulated from one another by at least two runners, each runner comprising a tension insulator and at least one elongate metal member mechanically connected together, which runners are attached at each of their ends to the end of a contact wire and are so disposed that the metal of one runner at one end of the tension insulator in the longitudinal direction, overlies the metal member of a second runner which lies at the opposite end of the tension insulator, at least two of the runners being held in spaced horizontal relationship on opposite sides of the longitudinal centre line of the section insulator and being insulated one from the other by at least one elongate insulating member which extends transversely of the longitudinal centre line, each said tension insulator being an elongate member of electrically insulating material and, in the mechanical connection between the tension insulator of each runner and the elongate metal member, an insulating end part of the elongate electrically insulating member and an end part of the elongate metal member overlap and are interconnected by separate securing means the undersurfaces of said end parts of the elongate electrically insulator material and the elongate metal member constituting a smooth running surface for a current collector travelling beneath and in contact with the mechanical connection.

4,350,852

BI-STABLE MECHANISM AND ANTI-THEFT DEVICE FOR A MOTOR VEHICLE COMPRISING SUCH MECHANISM

Guy Neyret, Oullins, France, assignor to Sodex-Magister, Societe d'Exploitation des Brevets Neiman, Croissy, France

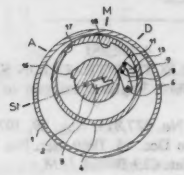
Filed Dec. 4, 1980, Ser. No. 212,774
Claims priority, application France, Dec. 7, 1979, 79 30061
Int. Cl.³ H01H *27/06*
U.S. Cl. 200—42 A 1 Claim

1. A bi-stable mechanism comprising:

(a) a housing,

(b) a lever pivotally mounted in said housing about an axis and movable between first and second stable positions, and

(c) a spring for urging said lever towards one of said stable positions according to selection, said spring being of a hairpin-type spring of which one end is connected to one end of the said lever and the other end mounted so as to pivot at a fixed point, the distance between the ends of the spring when the lever is in either stable position is greater than the distance between the point of location of the



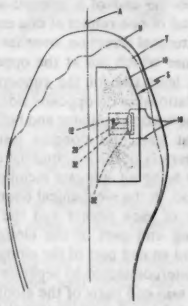
spring end with the lever end when the lever is at its centre position whereby the spring becomes more compressed as the lever approaches the centre position where the lever is unstable; the pivoted leg of the hairpin spring being accommodated at the apex of a triangular cut-out of said housing, while the other leg of the spring can come to rest at either of the other two points of the triangular cut-out.

4,350,853

ALARM TOE SWITCH

Floyd P. Ganyard, Albuquerque, N. Mex., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Nov. 18, 1980, Ser. No. 208,099
Int. Cl.³ H01H *9/00*
U.S. Cl. 200—52 R **7 Claims**



1. A covert duress alarm toe device of unitary construction for insertion within a shoe and activation by toe pressure for covert energization of an alarm circuit comprising:

a substantially flat insole mounting pad having top and bottom surfaces and adapted for placement within a shoe;

a miniature reed switch affixed within said mounting pad, said bottom surface of said pad including a slot substantially perpendicular to and adjacent said switch;

permanent magnet means for operating said reed switch positioned for movement within the slot, said magnet means being of greater thickness than the mounting pad thickness to create a bump above the surface of said mounting pad for facilitating movement of the magnet means by toe pressure from a first position in inoperative relation to said reed switch to a second position in operative relation to said reed switch, whereby the alarm circuit is energized; and

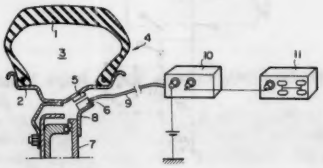
spring means positioned in the slot adjacent said magnet for returning said magnet to said first position when toe pressure is removed.

4,350,854

PRESSURE-SENSITIVE SWITCH UNIT IN RESONATOR ASSEMBLY OF TIRE PRESSURE DROP DETECTING APPARATUS

Akira Matsuda, Higashi Murayama; Yoshihiro Havakawa, Akigawa; Shigeo Yasuda, Musashino; Motoaki Iwasaki, Musashino, and Hiroshi Nishino, Musashino, all of Japan, assignors to Bridgestone Tire Company Limited and Mitaka Instrument Company Limited, both of Tokyo, Japan

Filed Jun. 27, 1980, Ser. No. 163,476
Claims priority, application Japan, Jul. 3, 1979, 54/91628[U]
Int. Cl.³ H01H *35/24*
U.S. Cl. 200—61.25 **18 Claims**



1. A pressure-sensitive switch unit to form part of a resonator assembly for use in an apparatus for detecting a pressure drop in a tire chamber of a tire-and-wheel assembly which consists essentially of a wheel rim and a pneumatic tire fitted to the wheel rim and which has said tire chamber formed between the tire and the wheel rim, comprising:

an outer receptacle,

an inner receptacle fixedly positioned within the outer receptacle with a gap formed between the inner faces of said outer receptacle and the outer surfaces of the inner receptacle and open to the atmosphere,

a casing structure received in said outer and inner receptacles, the casing structure being at least in part encapsulated in a body of a dielectric potting compound received in said inner receptacle,

a connecting member fixedly connecting said outer and inner receptacle to said wheel rim of said tire-and-wheel assembly, the connecting member fitted to said casing structure and formed with a passageway for communicating with the tire chamber in said tire-and-wheel assembly,

a resilient diaphragm positioned between the casing structure and the connecting member and forming a variable-volume pressure-acting chamber between the diaphragm and the connecting member and a variable-volume atmospheric chamber between the diaphragm and the casing structure, the pressure-acting chamber being open to said passageway, the casing structure having an axially elongated contact element having an end portion axially projecting into said atmospheric chamber toward said diaphragm, the end portion of said contact element and said diaphragm being engageable with each other for providing electrical connection therebetween,

the casing structure and said connecting member respectively having inner and outer surface portions which are held in contact with each other and which have formed therebetween an interstice which is open at one end to said gap between said outer and inner receptacles and which communicates at the other end with said atmospheric chamber, and

a body of gas-permeable synthetic rubber which is applied to said surface portions adjacent said one end of said interstice and which is in part exposed to the atmosphere through said gap between said outer and inner receptacle for providing air communication between the atmosphere

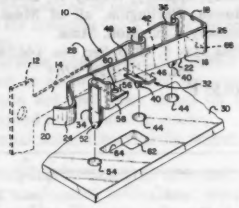
and said interstice through said body of the gas-permeable synthetic rubber.

4,350,855

ELECTRICAL SWITCH ASSEMBLY

Clifford F. Bobb, Carlisle, and Norwood C. Graeff, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 22, 1980, Ser. No. 218,853
Int. Cl.³ H01H 1/26
U.S. Cl. 200—292 1 Claim



1. An electrical switch assembly of conductive material for being mounted as a one piece assembly onto a circuit board or the like, the assembly comprising:

a. a first arm with a post depending therefrom for being inserted into a circuit board;

b. a vertically extending contact post detachably attached to the first arm to change the one piece switch assembly into a two piece switch assembly after being mounted on the circuit board and with a free end of the post being adapted for insertion into a circuit board;

c. a second, resilient arm spaced from and extending parallel to the first arm and hingedly connected thereto at one end to comprise a swingable, cantilever spring blade biased to bear against said contact post; and

d. removable retaining means for holding the second arm away from the contact post

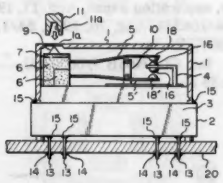
during the mounting of the switch assembly onto a circuit board and thereafter removing said retaining means so that the blade is normally in contact with the contact post.

4,350,856

RELAY FOR PRINTED CIRCUIT BOARD

Takahisa Shiratori; Masaru Tamura, and Kouji Hanada, all of Suzaka, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 10, 1980, Ser. No. 196,031
Claims priority, application Japan, Oct. 23, 1976, 51/146903
Int. Cl.³ H01H 9/02
U.S. Cl. 200—306 10 Claims



1. A relay adapted to be mounted on a printed circuit board, comprising a relay body and a relay cover which is mounted in a fluid-tight fashion to the relay body, said relay cover being provided with a thin-walled portion which can be broken to define an opening therein, and

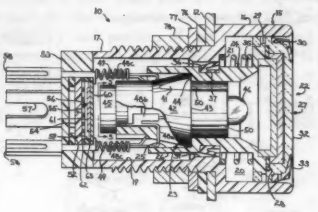
said relay body is provided with a projection which is located directly below said thin-walled portion and which is adapted to break the latter upon contact therewith.

4,350,857

ILLUMINATED INDUSTRIAL MEMBRANE SWITCH

Gary C. Fillus, South Milwaukee, Wis., and Eric L. Long, Northbrook, Ill., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Oct. 3, 1980, Ser. No. 193,489
Int. Cl.³ H01H 9/20
U.S. Cl. 200—314 10 Claims



1. An illuminated electrical switch which comprises:

an operator housing with a front end, a rear end and an opening therethrough from a housing entrance at the front end to a housing exit at the rear end;

an operator disposed in the opening in the operator housing, the operator extending from one end near the housing entrance to a distal end spaced inwardly from the housing exit, the operator being mounted for movement within the operator housing such that the distal end of the operator is movable toward the housing exit to actuate the switch, the operator including an axially extending plunger portion that forms the distal end, the plunger having an opposite end in which a bulb socket is formed, and the operator also having a cap portion that fits over the bulb socket end of the plunger portion;

a pair of bulb contact members disposed within the bulb socket and extending radially outward from the plunger portion into the opening within the operator housing;

a pair of bulb contact springs, each spring being mounted on a respective bulb contact member and extending towards the exit of the operator housing;

a contact support structure coupled to the operator housing;

a pair of lighting circuit terminals, each lighting circuit terminal being supported by the contact support structure, and each lighting circuit terminal being electrically connected to a respective bulb contact spring at a location corresponding to the radial extent of its respective bulb contact member to form a portion of a lighting circuit;

a substrate supported by the contact support structure, the substrate having a front side;

a pair of spaced apart contact termination areas disposed on the front side of the substrate radially inward of the electrical connections of the lighting circuit terminals to the bulb contact springs;

a pair of switch terminals, each being electrically connected to a respective termination area on the front side of the substrate; and

shorting means, disposed between and spaced from the distal end of the operator and the contact termination areas, and disposed radially inward of the connections of the lighting circuit terminals to the bulb contact springs, for movement by the distal end of the operator into contact with the termination areas to close a switch circuit that is formed within a space defined by the distance between the electrical connections of the lighting circuit terminals to the bulb contact springs.

4,350,858

APPARATUS AND METHOD FOR CONTROLLING ELECTRONIC CONTROLLED COOKING APPARATUS

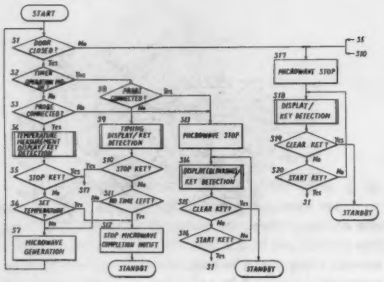
Masahiko Yoshida, Otsu, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Feb. 12, 1980, Ser. No. 120,740

Claims priority, application Japan, Feb. 19, 1979, 54-18614

Int. Cl.³ H05B 6/68

U.S. Cl. 219—10.55 B **8 Claims**



1. An electronically controlled cooking apparatus, comprising:

heating energy generating means for providing heating energy to a material being cooked,

control means for controlling said heating energy generating means in accordance with a predetermined cooking operation, said control means having a temperature input for determining its operation,

data entry means including a temperature operation mode commanding means for commanding the performance of a temperature operting mode and a time operation mode commanding means for commanding the performance of a time operation mode, means for selectively entering numerical data for the temperature of said temperature operating mode, and heating initiate command means for commanding initiation of the operation of said heating energy generating means,

storage means for storing said data entered from said entry means of the performance of said temperature mode and the numerical data,

temperature detecting means adapted for detachable electrical coupling to said temperature input of said control means for detecting thwe temperature of said material being cooked,

coupling state detecting means responsive to operation of said temperature operation mode commanding means and said heating initiate command means for initiating the operation of said heating energy generating means for producing a first output if said temperature detecting means is uncoupled from said temperature input and producing a second output if said temperature detecting means is coupled to said temperature input, said coupling state detecting means being further responsive to operation of said time operation mode commanding means for producing a third output if said temperature detecting means is coupled to said temperature input of said control means,

means for producing a sensory perceptible alarm signal,

said control means including first command means responsive to said first output from said coupling state detecting means for enabling said alarm means and inhibiting the operation of said heating energy generating means,

second command means responsive to production of said second output of said coupling state detecting means following the initiation of said alarm signal and after coupling of the temperature detecting means to said temperature input of said control means for controlling said heating energy generating means based on said data entered by said entry means prior to initiation of said alarm signal and said temperature of said material being cooked as detected by said temperature detecting means, and

invalidating means responsive to said third output of said coupling state detecting means for invalidating an operation of said heating initiate commanding means and enabling said alarm means.

4,350,859

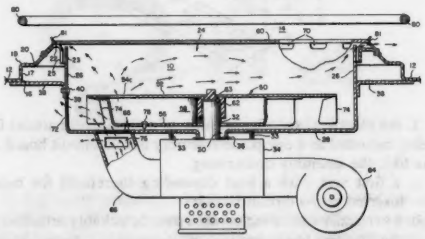
MICROWAVE OVEN FEED SYSTEM

Kenneth W. Dudley, Sudbury; Wesley W. Teich, Wayland, and Robert F. Bowen, Burlington, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 5, 1980, Ser. No. 146,561

Int. Cl.³ H05B 6/64

U.S. Cl. 219—10.55 F **18 Claims**



1. In combination:

an enclosure for exposing bodies to microwave energy comprising a plurality of metallic surfaces, one of said surfaces having an aperture;

a magnetron mounted external to said enclosure and having its output probe inserted through said aperture into said enclosure;

a dielectric bearing supported by said output probe in said enclosure;

a primary microwave energy radiator supported by said bearing in said enclosure, said radiator being energized by said output probe; and

means for rotating said primary radiator about an axis passing through said probe.

4,350,860

HEATING APPARATUS WITH SENSOR

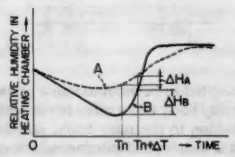
Shigeki Ueda, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 18, 1980, Ser. No. 178,935

Claims priority, application Japan, Aug. 17, 1979, 54/105317; Aug. 20, 1979, 54/106331; Aug. 20, 1979, 54/114896[U]; Aug. 20, 1979, 54/114897[U]

Int. Cl.³ H05B 9/06, 1/02

U.S. Cl. 219—10.55 B **6 Claims**



1. A heating apparatus having a plurality of sensors comprising:

a heating chamber adapted to receive a substance to be heated therein,

heating means for supplying heat toward and into said heating chamber,

sensor means including at least first and second sensors of said plurality of sensors for respectively sensing two different items of physical data independently representing the heating condition of said substance,

a main control unit including a ROM, said main control unit estimating the state of progress of a heating sequence for said substance by comparing the physical data sensed by either said first sensor or said second sensor means with a reference level stored in said ROM,

timer means for counting clock pulses applied to said main control unit,

a heating duration control unit controlled by said main control unit in accordance with the outputs from said sensor means and said timer means for controlling the power supplied to said heating means,

a heating control unit for varying the output of said heating means,

a manipulator panel including an automatic cooking select key and a temperature setting key, wherein when said automatic cooking select key is depressed said first sensor is selected and when said temperature setting key is depressed said second sensor is selected, and

a semiconductor voice synthesizer unit for reading out voice data from a semiconductor voice data memory in accordance with address data entered from said main control unit and for synthesizing the read-out voice data into corresponding voice information, said main control unit outputting said address data so that appropriate voice data including warning signals and other information required for proper use of said heating apparatus and inherent to the selected first or second sensor is read out.

4,350,861

APPARATUS FOR HEATING STRIP ELEMENTS IN A CONTINUOUS PASS PROCESS BY ELECTROMAGNETIC INDUCTION

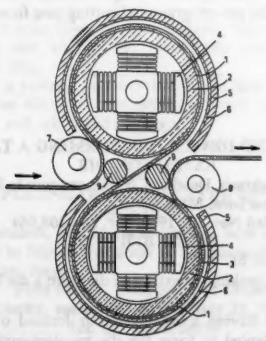
Jean P. Pouillange, Aulnay-sous-Bois; Jean P. Gaydon, Marly-le-Roi, and Bernard Chausse, Bourg-la-Reine, all of France, assignors to Compagnie Electro-Mecanique, Paris, France

Filed Jul. 8, 1980, Ser. No. 166,846

Claims priority, application France, Jul. 9, 1979, 79 17717

Int. Cl.³ H05B *6/10*

U.S. Cl. 219—10.61 R **9 Claims**



1. Apparatus for direct electromagnetic inductive heating of a metallic strip-shaped item in a continuous pass process wherein the metallic item forms the inductive element, comprising:

a hollow refractory drum having an exterior surface and means for guiding a continuously moving metallic strip shaped item along a path whereby the item is supported on said exterior surface of said drum and forms a substantial portion of an appreciably circular loop;

a magnetic inductor including a plurality of magnetized poles disposed within said drum with their polarized surfaces parallel to, and arranged about, the central axis of said loop, for generating a magnetic field of constant strength,

means for rotating said inductor about said axis to provide relative motion between said inductor and the metallic item; and

means external to said drum and the loop for providing a return path for the magnetic flux around and across said loop, whereby said portion of the loop formed by said metallic item forms an inductive element that is directly heated by said magnetic field.

4,350,862

FEEDING DEVICE IN A WELDING MACHINE FOR FEEDING CAN BODIES TO ELECTRODE ROLLS

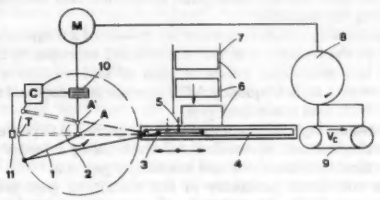
Othmar Stieger, Zurich, Switzerland, assignor to Paul Opprecht, Bergdietikon, Switzerland

Filed Jul. 3, 1980, Ser. No. 165,703

Claims priority, application Switzerland, Jul. 19, 1979, 6731/79; May 5, 1980, 3482/80

Int. Cl.³ B23K *11/06*

U.S. Cl. 219—64 **3 Claims**



1. An apparatus for transporting at a predetermined final speed successive can bodies at selectable spacings along a path of travel,

comprising in combination,

entrainment means movable in opposite directions between a can body receiving station and a pair of continuously rotating electrode rolls and being operable to convey successive can bodies from said receiving station towards said electrode rolls and to deliver them to said electrode rolls at said final speed,

rotary-to-linear movement conversion means, including a crank normally adapted to be driven at a prearranged angular velocity by drive means, a connecting rod pivoted to said crank and connected to said entrainment means,

an enlongated guiding means operable for guiding said entrainment means during its movement,

a clutch adapted to be driven by said drive means and normally connected to, but disconnectable from said crank, for cyclically reducing said angular velocity to zero upon being disconnected from said crank following a complete rotation of said crank,

whereby said crank comes to a complete stop, and the spacing of successive can bodies may accurately be adjusted without changing said predetermined final speed at the electrode rolls.

4,350,863

HIGH-FREQUENCY POWER FEEDER CIRCUITRY AND SUPPLY FOR ELECTRICAL DISCHARGE MACHINING

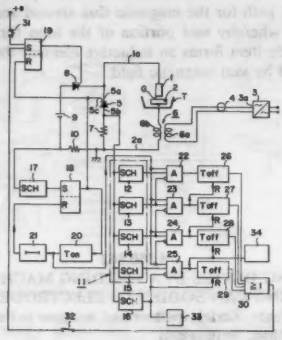
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Continuation-in-part of Ser. No. 16,423, Mar. 1, 1979, Pat. No. 4,277,668. This application Jun. 10, 1980, Ser. No. 158,124

Claims priority, application Japan, Mar. 7, 1978, 53-26332; Jun. 13, 1979, 54-73542

Int. Cl.³ B23P 1/08

U.S. Cl. 219—69 P 16 Claims



1. A method of supplying to an EDM gap formed between a tool electrode and a workpiece electrode, a sequence of successive and time-spaced trains of discrete and time-spaced elementary machining pulses of a predetermined polarity relative to said tool and workpiece electrodes, said method comprising the steps of:

generating a high-frequency AC power of a frequency equal to the frequency of said discrete and time-spaced elementary machining pulses in each of said successive trains with a high-frequency AC generator unit disposed remote from said machining gap;

transmitting said generated high-frequency AC power in an original and unrectified AC form along a feeder to the direct proximity of said machining gap; and

in said direct proximity of the machining gap, generally periodically interrupting said transmitted high-frequency AC power at a frequency lower than the first-mentioned frequency and simultaneously rectifying the uninterrupted portion of said transmitted high-frequency AC power, thereby producing said sequence of the successive and time-spaced trains of discrete and time-spaced elementary machining pulses of said predetermined polarity and permitting said sequence to be applied directly across said EDM gap, with the distance between said direct proximity from said gap such that there is little loss of power due to stray resistance and inductance and the pulse waveform across said gap is substantially free from distortion.

4,350,864

TRAVELING WIRE EDM APPARATUS WITH AUTOMATIC WIRE RETHREADING MECHANISM

Johann Jänicke, La Chapelle Rambaud, France, and Roger Girardin, Vernier, Switzerland, assignors to Ateliers des Charmilles, S.A., Geneva, Switzerland

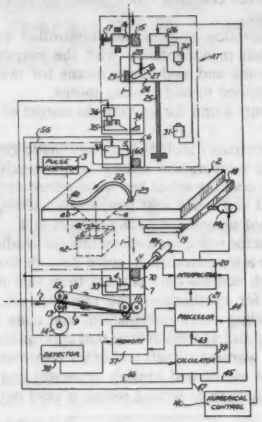
Filed Jun. 12, 1980, Ser. No. 158,914

Claims priority, application Switzerland, Jun. 21, 1979, 5800/79

Int. Cl.³ B23P 1/12

U.S. Cl. 219—69 W 6 Claims

4. An EDM process for cutting a workpiece by a traveling wire electrode comprising threading said wire electrode through a hole pre-drilled in said workpiece prior to effecting a cutting pass in said workpiece, grasping the end of said wire passed through said hole in conveyor means for feeding said wire longitudinally, applying electrical machining pulses across a machining zone between said wire and said workpiece, transversely displacing said wire and said workpiece relative to each other for effecting a cut in said workpiece along a pre-programmed path, detecting rupture of said wire when occurring at any point of said cutting path, cutting off said machining pulses upon detection of said wire rupture, returning said wire and said workpiece from the position of wire rupture to their initial relative position corresponding to the location of said pre-drilled hole in said workpiece by passing through an intermediate position wherein the end of said



wire is suspended outside the area of said workpiece, cutting off the end of said wire at said intermediate position, rethreading the end of said wire at said initial relative position through said pre-drilled hole, grasping the end of said wire and entraining said wire by means of a feeding mechanism for longitudinal feed through the machining zone between said wire and said workpiece, returning said wire and said workpiece through the previously cut path to the point of wire rupture, and starting said cutting operation from said point of rupture by re-establishing electrical discharges across said machining zone and by displacing said wire and said workpiece relative to each other according to said pre-programmed cutting pass from said point of rupture on.

4,350,865

METHOD AND DEVICE FOR FORMING A TAPERED EXTRUSION DIE

Benjamin I. Bachrach, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 21, 1980, Ser. No. 208,964

Int. Cl.³ B23P 1/12

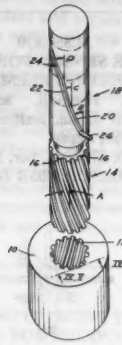
U.S. Cl. 219—69 M 7 Claims

1. A tool for making an extrusion die from a die blank comprising:

an electrode having a lobed contour formed on its outer surface adapted to form the die by electrical discharge machining upon passing the electrode through the die blank;

a lead bar adapted to rotate the electrode about the electrode axis and to displace the electrode axially with respect to the die blank, the lead bar having a guide recess formed thereon, the recess being disposed angularly with respect to the axis of the electrode thus forming a second angle

therebetween, the first and second angles being unequal; and



a guide pin fixed against movement extending within and engaging the guide recess whereby the path along which the electrode passes through the die blank is controlled.

4,350,866

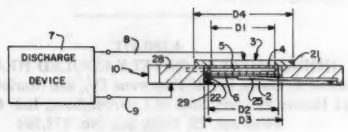
DISCHARGE DEVICE AND METHOD FOR USE IN PROCESSING SEMICONDUCTOR DEVICES

John J. Zasio, Sunnyvale, and Michael W. Samuels, San Jose, both of Calif., assignors to Fujitsu Limited, Japan

Continuation of Ser. No. 840,674, Oct. 11, 1977, abandoned. This application Nov. 29, 1979, Ser. No. 98,523

Int. Cl.³ B23K *15/00*; B23P *1/00*

U.S. Cl. 219—121 EM **2 Claims**



1. A process for making electrical contact to a conductive region of a wafer comprising,

covering a conductive region of the wafer with an insulating layer,

forming a resist layer on said insulating layer,

engaging said wafer in an electrically conducting wafer holder, and,

applying a voltage between said wafer and said holder to cause an electrical connection between said conductive region and said wafer holder.

4,350,867

FUSION SPLICING OF MULTI-LAYER OPTICAL FIBER BUNDLES

Kyoichi Kinoshita, and Morio Kobayashi, both of Mito, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed May 7, 1980, Ser. No. 147,670

Claims priority, application Japan, May 21, 1979, 54-62467

Int. Cl.³ B23K *26/04*

U.S. Cl. 219—121 LC **17 Claims**

1. An optical fiber splicing apparatus for splicing optical fibers in a bundle of optical fibers having first and second optical fiber groups, each composed of a plurality of optical fibers arranged in layers, comprising:

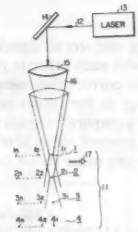
alignment mating means for holding the optical fibers of said first and second fiber groups in predetermined positions so that the axes of the corresponding pairs of individual fibers in each layer are parallel and the end faces thereof are butted together in alignment;

a light source disposed adjacent one side of said bundle for emitting a light beam from said side toward the optical fibers in said bundle to heat them;

a focusing optical system for focusing said light beam on at least one joint of the butted optical fibers in such a manner that the heating temperature of only the optical fibers on which the light beam is focused exceeds their melting point thereby to splice said optical fibers together; and

means for moving the focusing optical system and the alignment mating means relative to each other to shift the focal position of the light beam emitted from said one side of said bundle relative to said layers thereby to change the layer of said bundle in which fibers are being spliced.

15. A method of splicing a first group of optical fibers to a second similar group of optical fibers, comprising the steps of aligning the end portions of said first and second groups of



optical fibers so that the axes thereof are parallel and the endfaces thereof are in contact, forming a plurality of layers of aligned fibers, focusing a light beam on a butted joint of optical fibers in a selected one of said layers to heat only the fibers in said butted joint to a temperature in excess of the melting point of said fibers so that the endfaces of the optical fibers at said joint are fused together, effecting first relative movement between said light beam and the optical fibers in a direction perpendicular to the axes of the fibers without changing the focal length of said light beam to cause the pairs of abutted optical fibers in only said selected layer to be spliced in succession, changing the focal length of said light source in a second direction perpendicular to the direction of said first relative movement to change the effective focal position of said light beam relative to said layers, and thereafter repeating said first relative movement between said light beam and said fibers to cause the fibers in a layer which is behind the fibers of said selected layer to be spliced together in succession.

4,350,868

FOLLOW-UP CONTROL APPARATUS FOR CONTROLLING THE MOVEMENT OF A WELDING WEAVING DEVICE

Masaharu Takagi, Takatsuki, and Yoshinori Nishida, Suita, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 9, 1976, Ser. No. 703,817

Claims priority, application Japan, Jul. 14, 1975, 50-86513; Dec. 4, 1975, 50-145422; Dec. 11, 1975, 50-148166; Feb. 20, 1976, 51-18100

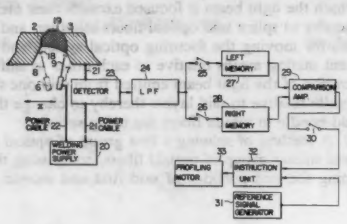
Int. Cl.³ B23K *9/12*

U.S. Cl. 219—137 R **7 Claims**

1. In a welding process wherein an electric arc is traveled along a mean predetermined path from which it tends to deviate, in which said arc as it travels along said path is also reciprocated transversely of said path between and alternately towards two opposite extreme positions, at least one of said lateral extreme positions being represented by a physically projecting wall element located alongside the travel path, and wherein the arc current tends to change in value when the arc

approaches either extreme lateral position, the improvement in control of said arc mean travel position which comprises, in combination, the following steps:

(a) obtaining from the arc and storing separate timed signals indicative respectively of the arc current value when the arc is in the vicinity of said extreme positions in its transverse reciprocations,



(b) comparing said stored signals from the opposite extreme positions with each other to obtain a control signal showing need to correct the mean lateral position of the arc with respect to the travel path when the difference between said compared signals indicates such need, and

(c) using the control signal thus obtained to initiate correction of the arc mean travel position.

4,350,869

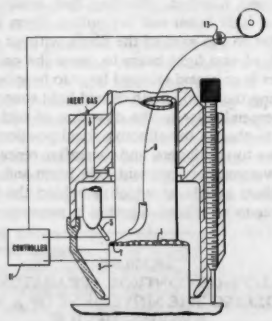
METHOD OF AUTOMATICALLY WELDING WITH A NON-CONSUMABLE ELECTRODE

Joseph H. Kiefer, Tampa, Fla., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 6, 1980, Ser. No. 175,604

Int. Cl.³ B32K *9/10*

U.S. Cl. 219—137 R **1 Claim**



1. A method of laying down at least a portion a weld bead over a predetermined path on a workpiece utilizing a non-consumable electrode and inert gas blanketing, said method comprising the steps of:

positioning the non-consumable electrode a fixed distance from the workpiece;

moving the non-consumable electrode over the predetermined path at a predetermined rate while maintaining the fixed distance from the workpiece;

establishing an arc between the non-consumable electrode and the workpiece so as to form a weld puddle of molten metal on the workpiece; and

only adding filler metal to the weld puddle when the arc voltage rises above a predetermined level and only adding the filler metal at a rate necessary to maintain that predetermined arc voltage between the non-consumable electrode and the weld puddle, thereby preventing contamination of the non-consumable electrode with filler metal.

4,350,870

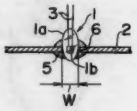
TEMPERATURE SENSOR FOR SHEET-SHAPED HEATING ELEMENT

Shigeru Nakayama, Hachioji, and Tastuo Takizawa, Sagamihara, both of Japan, assignors to Olympus Optical Company Ltd., Tokyo, Japan

Filed Feb. 27, 1981, Ser. No. 238,999

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—216 **11 Claims**



1. A controlled heater device comprising an electrical planar heating member and a temperature sensor for determining the operating temperature of said planar heating member by means of a thermistor, comprising:

a thermistor including a heat sensitive element enclosed within an envelope and having lead wires extending from one end of said envelope, said envelope being heat conductive and electrically insulative;

said planar heating member having a mounting aperture formed therein;

said thermistor being disposed within said mounting aperture and adhesively secured by a heat conductive adhesive to said heating member, such that said lead wires are disposed substantially normal to the plane of said planar heating member.

4,350,871

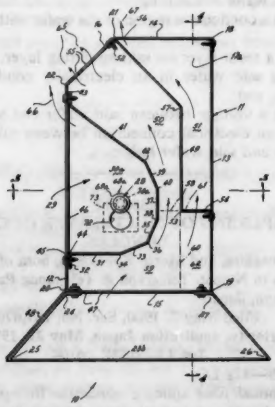
HORIZONTAL PASSIVELY COOLED HEATER

Raymond K. Davis, Sr., 40 Edgewood Dr., and Marion C. Burns, 111 Heiner Heights, both of Lawrenceburg, Ind. 47025

Filed Jul. 25, 1980, Ser. No. 172,164

Int. Cl.³ H05B *1/00*; F24C *7/00*

U.S. Cl. 219—343 **9 Claims**



1. A heater comprising an elongated generally rectangular horizontal housing having front, back, top, and bottom walls and an angled wall extending from said front wall upwardly to said top wall connecting said front and top wall;

an opening in said front wall;

a reflector positioned within said housing in alignment with said opening in said front wall; a horizontal heating element positioned in front of said reflector; a first series of exhaust openings within said angled wall; a second series of exhaust openings within said top wall; a divider panel located between said first series of openings and said second series of openings; creating a front flow chamber and a rear flow chamber; said first series of openings opening into said front chamber and said rear series of openings opening into said rear chamber; a series of intake openings within said bottom panel; a barrier panel extending below said bottom wall, said barrier panel being located forwardly of said series of intake holes; and

said barrier panel substantially preventing air from being drawn from beneath said bottom panel forwardly of said heater.

4,350,872

ELECTRICAL HEATING ELEMENT FOR FLUID MEDIA AND METHOD FOR PRODUCING SAME

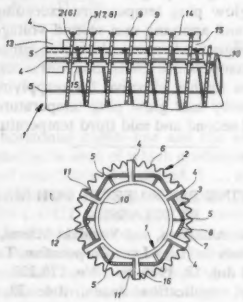
Klaus Meywald, and Helmut Ohnmacht, both of Kandel, Fed. Rep. of Germany, assignors to Firma Fritz Eichenauer, Kandel, Fed. Rep. of Germany

Filed Nov. 5, 1979, Ser. No. 91,460

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1978, 2849266

Int. Cl.³ H05B *3/02*

U.S. Cl. 219—376 **12 Claims**



1. Electrical heating element for fluid media, especially for hot air appliances, of the type having a support member of an insulating material and at least two heating conductors of resistance wire helically wound with a mutual radial spacing therebetween and supported on supporting edges of the support member, the improvement comprising the provision of a separate and independent set of supporting edges for each of said helically wound conductors, the height and peripheral location of the supporting edges of each set being different from set to set wherein each of said resistance wires is wound around the edges of a respective one of said sets of supporting edges with the turns of the wire resting axially spaced upon the edges of the respective set, and wherein the conductors are wound with differing pitches with respect to each other in a manner so that, when viewed in a radial direction, the turns of one of the two conductors are arranged at an intersecting angle with respect to the turns of the other of the two conductors.

4,350,873

BAKER'S OVEN

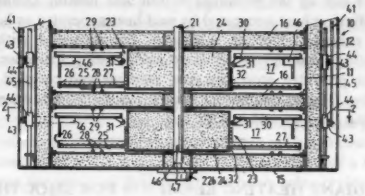
Paul E. Willett, 43 Porter St., Redcliffe, Queensland 4020, Australia

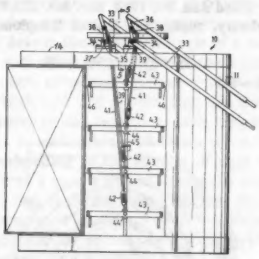
Filed Jul. 22, 1980, Ser. No. 171,262

Int. Cl.³ A21B *1/44*

U.S. Cl. 219—388 **7 Claims**

1. A baker's oven of the type having a casing with an interior of substantially vertical cylindrical form and being divided into a plurality of superimposed substantially cylindrical compartments, a loading door leading into each of said compartments, a shaft passing substantially coaxially through said compartments, a substantially horizontal support for articles to be baked within the lower part of each compartment and mounted on said shaft, heating means in each compartment, and means for driving said shaft to rotate simultaneously said





supports, the improvement comprising substantially horizontal heat insulating decks separating said compartments and being peripherally connected to said casing and centrally closely engaged about said shaft, and a substantially cylindrical heat insulating core in each compartment disposed coaxially about said shaft and extending upwardly from said support to a position close to the top of said compartment and rotating with said support.

4,350,874

HOT AIR SUPPLY TYPE ELECTRIC OVEN

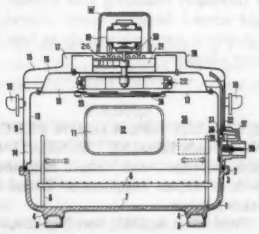
Hideo Nishikawa, Osaka, Japan, assignor to Imanishi Flexible Tube Mfg. Co., Ltd., Japan

Filed Aug. 14, 1980, Ser. No. 177,836

Claims priority, application Japan, Feb. 25, 1980, 55-22444

Int. Cl.³ A21B *1/22*; F27B *11/00*

U.S. Cl. 219—400 **8 Claims**



1. An electric oven of hot air supply type comprising a base made of a heat-resistant material, a meat support member mounted to said base, said base including a planar portion and

a peripheral wall portion extending transversely therefrom, said peripheral wall portion having a stepped surface at its upper end, a case member removably mounted on a stepped surface of said peripheral wall portion of said base to define a roasting chamber within said case member and base member, a reflector mounted within said case member adjacent the upper end thereof and defining a heating chamber and a radiating chamber, a heat generator mounted within said heating chamber, a hot air fan mounted within said heating chamber for transferring heat generated by said heat generator as hot air to said roasting chamber, a cooling fan provided within said radiating chamber adjacent to said heating chamber, and a motor provided atop said case member and coupled to said cooling fan and said hot air fan for simultaneously driving said cooling fan and said hot air fan.

4,350,875

RADIANT HEATING ELEMENTS FOR SMOOTH TOP COOKERS

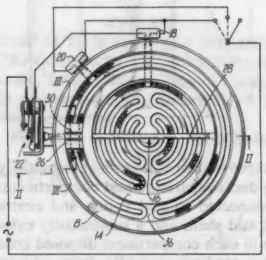
Joseph A. McWilliams, Droitwich, England, assignor to Micropore International Ltd., England

Filed Jan. 30, 1981, Ser. No. 229,999

Claims priority, application United Kingdom, Feb. 1, 1980, 8003559

Int. Cl.³ H05B *3/68*

U.S. Cl. 219—449 **10 Claims**



1. An electric radiant heater unit comprising:

a heater having at least first and second heater elements located adjacent to one another on a base of electrically and thermally insulating material;

means for providing a power source for said heater;

means for energizing said first heater element independently of said second heater element;

a thermal cut-out device for controllably disconnecting said power source providing means from said heater, which thermal cut-out device extends across said first heater element and across at least a part of said second heater element; and

means for thermally insulating said thermal cut-out device from said second heater element whereby said thermal cut-out device is responsive solely to heat emitted by said first heater element.

4,350,876

CONTROL CIRCUIT FOR A GLOW PLUG ASSEMBLY SERVING AS AN ENGINE PREHEATING MEANS

Yutaka Kubota, Kawagoe, and Hitoshi Sugimoto, Higashimatsuyama, both of Japan, assignors to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1981, Ser. No. 239,433

Claims priority, application Japan, Mar. 12, 1980, 55-31048

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—497 **4 Claims**

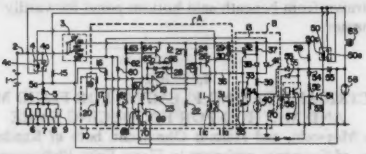
1. A control circuit in an engine for controlling the heating of at least one glow plug, comprising:

means for producing a temperature signal responsive to a temperature coefficient of resistance in said glow plug;

a key switch having at least an OFF position, an ON position and a START position;

first switch means responsive to placing said key switch in said ON position for applying a first voltage to said at least one glow plug whereby said glow plug is heated;

said first switch means being responsive to said temperature signal for interrupting said power to said glow plug when said temperature signal indicates a glow plug temperature exceeding a first temperature value, whereby said glow plug is preheated to said first temperature value;



second switch means responsive to placing said key switch in said START position for applying a second voltage lower than said first voltage to said at least one glow plug; and

said first switch means being effective, when said key switch is placed in said START position for applying said first voltage to said glow plug until said temperature signal indicates a glow plug temperature exceeding a second temperature and applying said second voltage until said temperature signal indicates a glow plug temperature less than a third temperature lower than said second temperature and then further effective for reapplying said first voltage whereby said glow plug temperature alternates between said second and said third temperatures.

4,350,877

CALCULATING RULE USEFUL FOR MAKING EYEGLASSES

Yasuo Yanagisawa, Akishima, and Yoshiaki Mitsui, Hino, both of Japan, assignors to Hoya Lens Corporation, Tokyo, Japan

Filed Jul. 18, 1980, Ser. No. 170,252

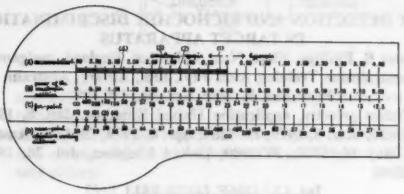
Claims priority, application Japan, Jul. 23, 1979, 54-101444[U]

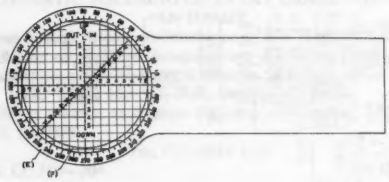
Int. Cl.³ G06G *1/06, 1/08*

U.S. Cl. 235—70 A **2 Claims**

1. A calculating rule which comprises a rule for ametropia and a rule for heterophoria: the rule for ametropia consisting of a rectangular fixed rule and a rectangular slide rule; the fixed rule having two scales (A) and (D) that are apart from each other, the upper scale (A) being the scale for accommodation in dioptric units and the lower scale (D) being the scale for near-point distance and also objective working distance in centimeter units; the scale (A) consisting of a left half scale used for the calculation in the case of both emmetropia and myopia and a right half scale used for the calculation in the case of hyperopia, each half scale graduated from the center at 0 to each end at 4.00 and the scale (D) consisting of a left half scale which is used for emmetropia and myopia and represents the value before the retina, and a right half scale which is used for hyperopia and represents the value behind the retina; the slide rule that slides between the scales (A) and (D) of the fixed rule having a scale (B) for power of the ametropia in dioptric units that is also the scale for addition in dioptric units, and a scale for (C) for far-point distance in centimeter units, the scale (B) graduated from 0 at the left end to 8.00 at the right end, and the scale (C) graduated from 12.5 at the right end to infinity (∞) at the left end; the slide rule also having, at the left end of the scales (B) and (C), an arrow mark (0) for designating the near-point distance on the scale (D); the rule for ametropia further having indicia on scale (A) dividing the left half of the

accommodation scale (A) into several regions (1), (2), (3), . . . , and several arrow marks (1), (2), (3), . . . disposed to the right of arrow mark (O) on the slide rule, corresponding in number to the several regions (1), (2), (3), . . . , each of which designates a respective objective working distance on scale D standing for the distance at which the eye having a value of accommodation in a definite region has to see and can continue to see with no asthenopia based on accommodation; and the rule for heterophoria consisting of a fixed circular rule (E) and a rotating circular rule (F); the fixed circular rule (E) having a counterclockwise circular scale graduated from zero to 360, in





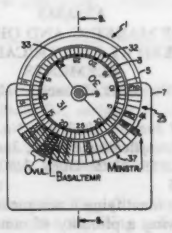
which the horizontal center-line and the vertical center-line into four guardrants, each of which graduates cross-sectionally in orthogonal coordinates 0, 1, 2, 3, 4, 5 . . . and labeled UP for the upward first and second quardrants, and labeled OUT-R-IN and IN-L-OUT which span the vertical center-line, in which R represents right eye, L represents left eye, OUT represents inward; (nose-side); and the rotating circular scale (F) is a transparent circular plate rotating at the axis that is the center of the fixed circular rule (E), which has a cursor that is a straight center-line graduated 0, 1, 2, 3, 4, 5, 6, 7 from the center in both directions with the same graduation as the fixed circular scale (E).

4,350,878

CONCEPTION CONTROL CALENDAR

Karl H. Schwarz, and Ingrid Schwarz, both of Urb. La Sirena No. 77, Benajarafe, Spain

Filed May 18, 1981, Ser. No. 264,683
Int. Cl.³ G06C *3/00*
U.S. Cl. 235—78 RC **10 Claims**



1. A conception control calendar adapted for use by women having menstrual cycles of constant length for predicting probable periods of fertility; said calendar comprising:

(a) a first circular disc having equally sized segments of a first group spaced circumferentially about an outer edge thereof with each first group segment subtending an equal inner angle, said first group segments representing the days in two calendar months;

(b) a second circular disc having a plurality of equally sized segments of a second group disposed about an outer edge thereof; each of said second group segments subtending an angle equal to said inner angle; said second group segments representing days associated with a menstrual cycle of a user; and

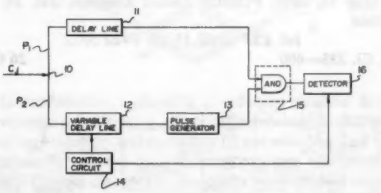
(c) a base plate having said first and said second discs concentrically and rotatably attached thereto; said base plate including an arcuate portion concentric with said first and second discs and having a plurality of segments of a third group thereon, said third group segments being registrable with said first and second group segments; said base plate having associated with one of said third group segments a menstrual cycle beginning marker and associated with other of said third group segments an ovulation indicator such that when a second group segments representing the number of days in the menstrual cycle of a user is placed in registry with a first group segment corresponding to the day that a next menstrual cycle of a user will start; and thereafter both said first second discs are simultaneously rotated relative to said base plate while remaining stationary relative to each other such that a second group segment corresponding to the number of days in the menstrual cycle of a user is placed in registry with said base plate menstrual cycle beginning marker, said base plate ovulation marker is in registry with first group segments corresponding to the period of expected ovulation in the present menstrual cycle of the user.

4,350,879

TIME JITTER DETERMINING APPARATUS

Kamilo Feher, Ottawa, Canada, assignor to Canadian Patents & Dev. Limited, Ontario, Canada

Filed Oct. 29, 1979, Ser. No. 89,585
Int. Cl.³ G06M *3/08*
U.S. Cl. 235—92 EC **14 Claims**



1. Apparatus for determining time jitter of a clock signal of period T_b, recovered from a received data signal, comprising:

means for applying the clock signal to first and second signal paths;

signal delay means for delaying the signals in the signal paths relative to one another by a variable delay factor;

logic means coupled to the first and second signal paths for detecting coincidence of the relatively delayed clock signals, and

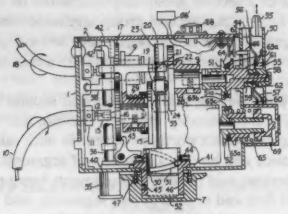
detector means coupled to the logic means for indicating the coincidence rate of the relatively delayed clock signals, as the delay is varied, whereby peak to peak time jitter is half of the relative shift of the delay between the point of minimum coincidence and the point of maximum coincidence.

4,350,880

AUTOMATIC FUEL-COST MONITORING SYSTEM

Bartholomew F. Quintilian, 4259 Sheldon Ave., Baltimore, Md. 21206

Filed Oct. 8, 1980, Ser. No. 195,088
Int. Cl.³ G01C 22/00
U.S. Cl. 235—96 20 Claims



1. A system for announcing to the driver the fuel cost of operating the engine of a motor vehicle having odometer input means comprising in combination: means (28) on a said motor vehicle for displaying said cost continuously during said operation, including

(a) means including said odometer input means (10) for driving said displaying means in ratio to vehicle speed,

(b) means including a speed selector dial (7) for setting said ratio in proportion to fuel cost,

(c) screw means (69) for further setting said ratio in proportion to average vehicle engine efficiency, and

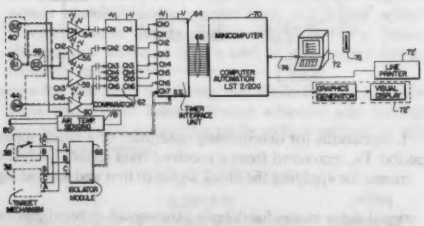
(d) means including a serve-actuator (50) for modifying said ratio in proportion to instantaneous engine efficiency during said operation.

4,350,881

PROJECTILE POSITION DETECTION APPARATUS

Lindsay C. Knight, Albury, Australia; Robert B. Phillips, Fleet, Near Aldershot, England; William H. Bowyer, Farnham, England, and Bruce Moxley, Reading, England, assignors to Australasian Training Aids, Pty., Ltd., Albury, Australia

Filed Jan. 8, 1980, Ser. No. 110,492
Claims priority, application United Kingdom, Jan. 8, 1979, 7900626; Mar. 8, 1979, 7908261; Apr. 4, 1979, 7911721; Australia, May 14, 1979, PD8800; United Kingdom, Jul. 24, 1979, 7925668
Int. Cl.³ G06F 15/20; F41J 5/12
U.S. Cl. 235—400 26 Claims



1. Apparatus for indicating the location in a measurement plane through which the trajectory of a projectile passes, the projectile travelling from a firing point toward a target zone and through said measurement plane, comprising:

a target member located in said target zone;

an array of at least three transducers responsive to an airborne pressure wave from the projectile and located at respective predetermined positions spaced along a line substantially parallel to said measurement plane;

means for measuring velocity of the projectile;

means for measuring velocity of propagation of sound in air in the vicinity of the array of transducers; and

computing means responsive to said array of transducers, said projectile velocity measuring means, and said propagation velocity measuring means comprising:

means for determining the location in said plane through which the trajectory of the projectile passes, and

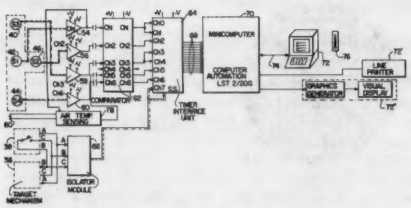
means for providing an output indicating said determined location.

4,350,882

HIT DETECTION AND RICHOCHET DISCRIMINATION IN TARGET APPARATUS

Robert B. Phillips, Fleet, Near Aldershot, England, assignor to Australasian Training Aids, Pty., Ltd., Albury, Australia

Filed Jan. 8, 1980, Ser. No. 110,498
Claims priority, application United Kingdom, Jan. 8, 1979, 7900626; Mar. 8, 1979, 7908261; Apr. 4, 1979, 7911721; Australia, May 14, 1979, PD8800; United Kingdom, Jul. 24, 1979, 7925668
Int. Cl.³ G06F 15/20; F41J 5/12
U.S. Cl. 235—400 11 Claims



1. Apparatus for use in marksmanship training in which a projectile travels along a trajectory from a firing point toward a target member and through a measurement plane comprising:

means for detecting and indicating relative to a target representation a location in said measurement plane through which said trajectory passes, thereby providing at least an approximate indication of where said projectile passes relative to said target member; and

means for measuring velocity of the projectile in the vicinity of the target member, comparing said measured velocity with at least one expected projectile velocity value to ascertain if said measured velocity is within an expected projectile velocity range, and providing an indication of the result of said comparison between said measured velocity and said at least one expected velocity value,

whereby a marksman is provided with an approximate indication of where the projectile passes relative to the target member, as well as an indication of whether the projectile has passed through said measurement plane in free flight or has ricocheted prior to passing through said measurement plane.

4,350,883

METHOD OF MARKING AND OF IDENTIFYING OBJECTS MARKED BY ELECTRICALLY CONDUCTING ELEMENTS

Pierre Lagarde, Versailles, France, assignor to Imphy S.A., Paris, France

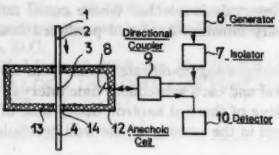
Filed Jun. 24, 1980, Ser. No. 162,670
Claims priority, application France, Jun. 26, 1979, 79 16351
Int. Cl.³ G01R 27/02; G06K 7/00; G08B 13/22
U.S. Cl. 235—435 8 Claims

1. A methodfor identifying a non-metallic object,

said object having a plurality of conductive members attached thereto, each of said members having a conductivity which form a unique code for said object, comprising:

successively subjecting each of said members on said object to an alternating electromagnetic field whereby a current is successively induced in each of said members;

detecting the intensity of a radiation component resulting from each of said members carrying a current induced by



said field, said radiation component being distinctive of a radiating member; and

recording each of said responses whereby a visual identification of said radiation components is provided identifying said object.

4,350,884

AUTOMATIC FOCUSING OF EVERY IMAGE POINT IN AN IMAGE

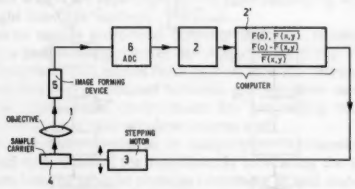
Dieter Vollath, Stutensee-Friedrichstal, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung, Karlsruhe, Fed. Rep. of Germany

Filed Mar. 19, 1980, Ser. No. 131,845

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1979, 2910875

Int. Cl.³ G01J *1/36*

U.S. Cl. 250—204 **4 Claims**



1. A method for automatically focusing every image point of an image of a sample formed by an optical objective, comprising, for each image point: deriving a representation of the autocorrelation function of the brightness distribution of the image of that image point; deriving a representation of the average of the auto correlation function of the brightness distribution of a plurality of image points in the region of that image point; deriving a representation constituting a function of the quotient formed by dividing the representation of said autocorrelation function for that image point by the representation of said average of the autocorrelation function; and varying the distance between the objective and the sample while iteratively performing said steps of deriving for determining the distance at which said function of the quotient has a maximum value.

4,350,885

BATTERY HYDROMETER WITH ANALOG OUTPUT

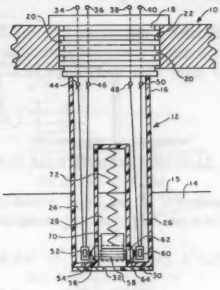
Bruce L. Patis, Addison, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Sep. 29, 1980, Ser. No. 191,785

Int. Cl.³ G01N *9/00*

U.S. Cl. 250—231 R **18 Claims**

1. A hydrometer for providing an analog indication of the specific gravity of a liquid comprising radiation source means for emitting a detectable beam of radiation; means arranged to be disposed within the liquid for continuously modulating the beam of radiation of said source in response to the specific gravity of the liquid; and detecting means arranged to receive



said modulated beam for providing an electrical signal continuously varying in magnitude responsive to said modulated beam of radiation.

4,350,886

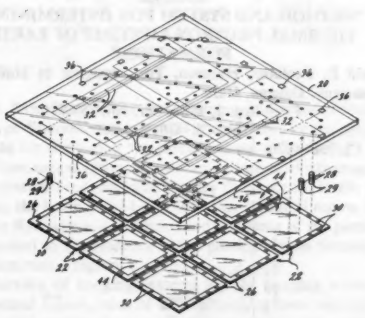
MULTI-ELEMENT IMAGER DEVICE

Dieter H. Pommerrenig, El Toro, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 25, 1980, Ser. No. 126,134

Int. Cl.³ H01J *5/02*

U.S. Cl. 250—239 **14 Claims**



1. In combination, a plurality of radiation sensitive devices, a transparent superstratum, electrical conductor means carried by said superstratum and mounting means attaching said radiation sensitive devices to said superstratum, said mounting means providing electrical connections between said radiation sensitive devices and said electrical conductor means.

4,350,887

METHOD OF ASSAYING URANIUM WITH PROMPT FISSION AND THERMAL NEUTRON BOREHOLE LOGGING ADJUSTED BY BOREHOLE PHYSICAL CHARACTERISTICS

Ralston W. Barnard, and Dal H. Jensen, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 5, 1980, Ser. No. 204,721

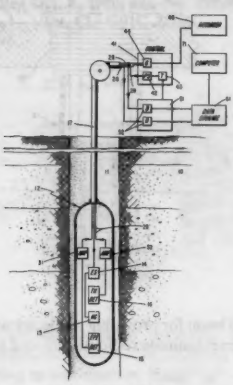
Int. Cl.³ G01J *5/00*

U.S. Cl. 250—265 **4 Claims**

1. A neutron logging method for assaying uranium formations traversed by a borehole comprising:

(a) obtaining at a plurality of logging points borehole log data defining prompt fission neutron counts and thermal neutron counts;

(b) determining the dieaway of either said prompt fission



neutron counts or said thermal neutron counts at each logging point; and

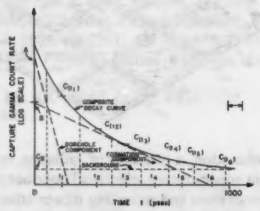
(c) producing uranium assay information at each logging point from the ratio of said prompt fission neutron count to said dieaway.

4,350,888

METHOD AND SYSTEM FOR DETERMINING THERMAL NEUTRON LIFETIME OF EARTH FORMATIONS

Harold E. Peelman, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 2, 1980, Ser. No. 183,516
Int. Cl.³ G01V 5/00
U.S. Cl. 250—270 **14 Claims**



1. A method for determining the thermal neutron decay time of earth formations in the vicinity of a well borehole, comprising the steps of:

irradiating earth formations in the vicinity of a well borehole with a relatively short duration pulse of fast neutrons which are rapidly slowed down to thermal energy and engage in capture interactions with the nuclei of elements in the borehole and earth formations in the vicinity of the borehole;

detecting in a plurality of at least six sequential, non-overlapping, time intervals subsequent to said neutron pulse, radiations indicative of the population of thermal neutrons in earth formations in the vicinity of the borehole and generating signals representative of the count rate of such radiations;

determining from said count rate signals in the ultimate and penultimate of said time intervals, a slope signal representative of the rate of decay of said thermal neutron population in the earth formations in the vicinity of the borehole;

comparing said count rate signals from the first and subsequent to the first of said time intervals with predicted count rate signals for such intervals based on a function of said slope signal, until a time interval in said sequence of time intervals is selected whose count rate is within an arbitrary constant Δ of said predicted count rate signal; and

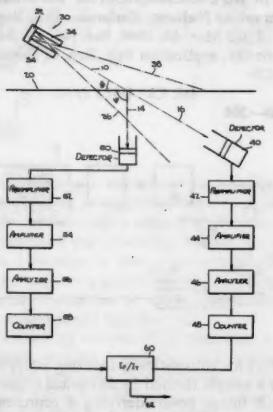
determining, using count rate signals from said selected time interval and each subsequent time interval, a signal representative of thermal neutron decay time of the earth formations in the vicinity of the well borehole.

4,350,889

X-RAY FLUORESCENT ANALYSIS WITH MATRIX COMPENSATION

Khaim Lisnyansky, Central Valley, N.Y., assignor to International Paper Company, New York, N.Y.

Filed Sep. 17, 1980, Ser. No. 188,046
Int. Cl.³ G01M 23/22
U.S. Cl. 378—46 **8 Claims**



1. An X-ray fluorescence method for determining the mean average concentration of an element in a sample having essentially parallel planar first and second faces in the region being tested, said method comprising:

(a) aiming a beam of primary photons of a predetermined energy E_1 at the first face of the sample such that the beam is at angle Φ to the first face;

(b) aiming a first X-ray detector at the second face of the sample to detect the transmitted beam of photons of energy E_1;

(c) aiming a second X-ray detector at the sample at angle Ψ to either face of the sample to detect the beam of characteristic secondary fluorescent photons of energy E_2 emitted by the particular element of interest in response to the irradiation by the beam of primary photons wherein

$$\frac{\sin \phi}{\sin \psi} \cong \frac{(E_2)^3}{(E_1)^3}\text{; and}$$

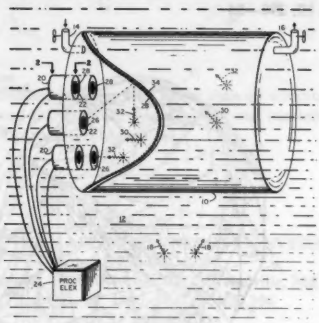
(d) utilizing the intensities of the transmitted and fluorescent beams to determine said concentration.

4,350,890

APPARATUS FOR MONITORING LOW LEVEL LIGHT EMISSION IN UNDERWATER ENVIRONMENT

Bruce D. Geelhood, La Mesa; Gary F. Mastny, San Diego; Jerry E. Solomon, San Diego; Edward J. Wesley, San Diego; Elek Lindner, San Diego; Carol A. Dooley, San Diego, and Sandra M. Lane, San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 12, 1980, Ser. No. 215,596
Int. Cl.[3] G01J 1/42; G01T 1/20; F01C 3/00
U.S. Cl. 250—372 14 Claims



1. Apparatus for monitoring low levels of light emission in a selected underwater environment, said apparatus comprising:

photodetection means having a light sensitive surface oriented into said environment for generating electrical signals which are representative of light impinging upon said light sensitive surface;

window means positioned between said light sensitive surface and said underwater environment for protecting said photodetection means from said underwater environment;

a first material positioned between said window means and said underwater environment for preventing biological growth upon said window means; and

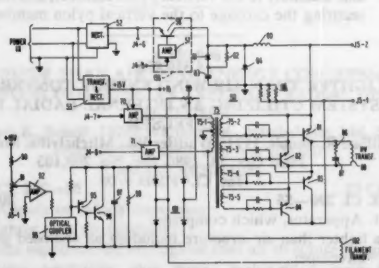
a second material placed in cooperative relationship with said first material for significantly increasing the attenuation lengths of light photons occurring in said underwater environment which have wavelengths included in a prespecified wavelength range.

4,350,891

LOW RIPPLE REGULATED X-RAY TUBE POWER SUPPLY

Don E. Wuerflein, Mountain View, Calif., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jul. 14, 1980, Ser. No. 168,479
Int. Cl.[3] H01J 40/14; H05G 1/30, 1/10
U.S. Cl. 378—110 22 Claims



15. A power supply for providing power to an X-ray tube, adapted to receive an unregulated voltage input and providing a regulated high voltage output and a separate tube filament output, having control means comprising:

voltage control means for regulating said high voltage output as a function of the unregulated voltage input to said supply; and

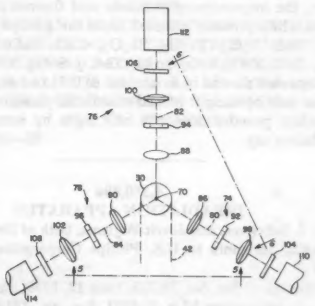
filament current control means for controlling the current delivered to said tube filament as a function of the current delivered to said tube from said high voltage control means.

4,350,892

X'-, Y'-, Z'- AXIS MULTIDIMENSIONAL SLIT-SCAN FLOW SYSTEM

David B. Kay, Rochester, and Leon L. Wheeless, Jr., Webster, both of N.Y., assignors to Research Corporation, New York, N.Y.

Filed Jul. 31, 1980, Ser. No. 174,280
Int. Cl.[3] G01N 21/64
U.S. Cl. 250—461.2 15 Claims



1. A flow fluorometer for obtaining multidimensional slit-scan type fluorescence contours of a particle, comprising:

means for conveying the particle along a flow axis;

an illumination system providing a beam of electromagnetic radiation for exciting secondary fluorescence in the particle, the beam focus being such that a central region along the flow axis is illuminated and a volume of the particle is excited to fluorescence as the particle passes through the illuminated region;

a plurality of imaging systems for slit imaging across the central region, each of said imaging systems viewing the central region along a respective optical axis, with said optical axes all lying substantially in a plane perpendicular to said flow axis, and the planes of the resultant slit-imaged portions in the central region being non-parallel with each other and non-parallel with said flow axis; and

a photodetector element coupled to each of said imaging systems for responding to fluorescence from each of the slit-imaged portions in the central region, each of said photodetector elements outputting a slit-scan type contour along a particle axis perpendicular to the plane of the respective slit-imaged portion.

4,350,893

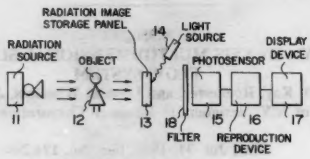
RADIATION IMAGE STORAGE PANEL

Kenji Takahashi, and Junji Miyahara, both of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 28, 1980, Ser. No. 144,656
Claims priority, application Japan, May 1, 1979, 54-53631
Int. Cl.[3] H05B 33/00
U.S. Cl. 250—484.1 13 Claims

1. In a radiation image storage panel, which is used in a process for recording and reproducing a radiation image

which consists essentially of steps of (1) exposing the panel to a radiation passing through an object to store a radiation image therein, (2) scanning said panel with a stimulating ray having a wavelength ranging from 500 nm to 800 nm to release the energy of the radiation stored therein as instantaneous fluorescent light, and (3) detecting said fluorescent light, having a fluorescent layer comprising a binder and a stimulable phosphor which emits instantaneous light when exposed to the



stimulating ray after exposure to a radiation dispersed in said binder, the improvement wherein said fluorescent layer contains a white powder selected from the groups consisting of TiO_2, ZnS, Y_2O_3, Ta_2O_5, Sb_2O_3, CaO, BaO, SrO, Al_2O_3, MgO, ZnO, ZrO_2, SiO_2, In_2O_3, GeO_2, SnO_2, Nb_2O_5 and BeO and dispersed therein in an amount of 0.01 to 1 parts by weight per one part by weight of said stimulable phosphor and where said white powder does not emit light by scanning of said stimulation ray.

4,350,894

IRRADIATION APPARATUS

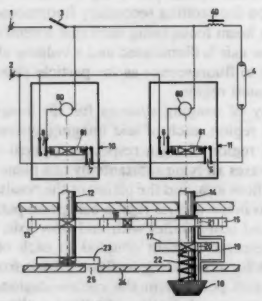
Gerrit J. Schrijver, and Jorrit Wijtsma, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 39,715, May 17, 1979, abandoned. This application Mar. 9, 1981, Ser. No. 241,806

Claims priority, application Netherlands, Jun. 13, 1978, 7806373

Int. Cl.³ G01J *1/00*; H05G *1/30*

U.S. Cl. 250—504 R **1 Claim**



1. Irradiation apparatus, which comprises an ultra-violet radiation source; two timers each adjustable to a selected period; means respectively associated with said two timers for terminating irradiation by the radiation source at the end of the selected period; an adjusting disk associated with each timer and movable therewith between a set position corresponding to said selected period and a zero position, each adjusting disk being provided with an opening; a control member movable from an inactive position to an active position for coupling the two adjusting disks together to simultaneously set both timers for said selected period, said control member having two pins respectively positionable in the openings in the adjusting disks; and a shaft having the two adjusting disks positioned thereon, one adjusting disk being affixed to the shaft and the other adjusting disk being freely rotatable on the shaft, whereby movement of the control member to its active position is prevented should either adjusting disk be in other than the zero position when the irradiation has been terminated.

4,350,895

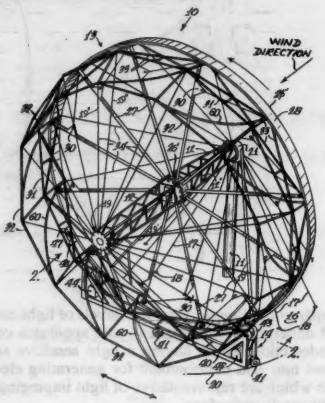
WIND TURBINE AND METHOD FOR POWER GENERATION

Gregory E. Cook, Lisle, Ill., assignor to Windpowered Machines Ltd., Warrenville, Ill.

Filed Mar. 3, 1980, Ser. No. 125,934

Int. Cl.³ F03D *5/04*

U.S. Cl. 290—55 **20 Claims**



1. A wind turbine, comprising:

(a) a vertically oriented wind turbine wheel having a rim structure, a generally horizontally oriented axle assembly including a hub suspended from said rim structure, and having means for carrying a plurality of soft airfoils disposed on spindles extending between said hub and said rim structure;

a moveable carriage underlying and supporting the wheel at its rim during rotation and having means for taking-off power mounted in engagement with said rim structure; and

(c) means spaced from the wheel and the carriage for constraining both the carriage and the wheel against movement other than along concentric circles, for preventing lateral shifting of the rim relative to the carriage, and for preventing the wheel from tipping, which constraining means includes a vertically extending pylon member anchored to ground spaced from and disposed upwind of both the wheel and the carriage, means for attaching the axle assembly to the vertical pylon member, and means for securing the carriage to the vertical pylon member.

4,350,896

LIGHTER THAN AIR WIND ENERGY CONVERSION SYSTEM UTILIZING AN INTERNAL RADIAL DISK DIFFUSER

William R. Benoit, 11718 Whittier Rd., Mitchelville, Md. 20716

Filed Oct. 24, 1980, Ser. No. 200,103

Int. Cl.³ F03D *9/00*

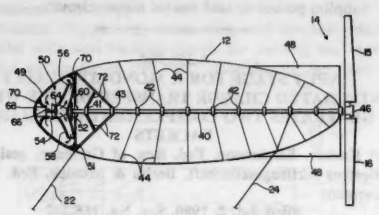
U.S. Cl. 290—55 **20 Claims**

1. Apparatus, which comprises:

a lighter than air structure including an enclosed gas-filled envelope;

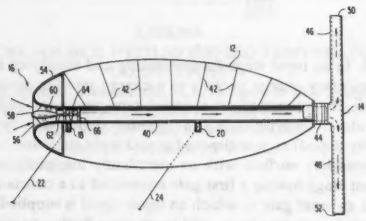
means supported by said lighter than air structure for generating electricity, said means including a main rotor adapted to be rotated by the wind, a diffuser mounted

within said envelope and coupled to rotate with said main rotor, a turbine in fluid communication with said diffuser, and an electrical generator coupled to said turbine; and



means connected between said lighter than air structure and the ground for tethering said structure and for delivering electricity from said generator.

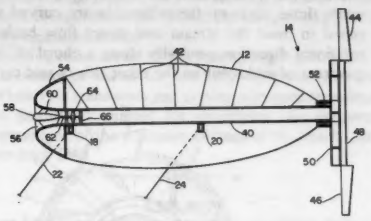
4,350,897
LIGHTER THAN AIR WIND ENERGY CONVERSION SYSTEM
William R. Benoit, 11718 Whittier Rd., Mitchelville, Md. 20716
Filed Oct. 24, 1980, Ser. No. 200,104
Int. Cl.³ F03D 9/00
U.S. Cl. 290—55 **17 Claims**



1. Apparatus, which comprises:
a lighter than air structure;
means supported by said lighter than air structure for generating electricity, said means including a main rotor adapted to be rotated by the wind, a turbine in fluid communication with said main rotor, and an electrical generator coupled to said turbine; and
means connected between said lighter than air structure and the ground for tethering said structure and for delivering electricity from said generator.

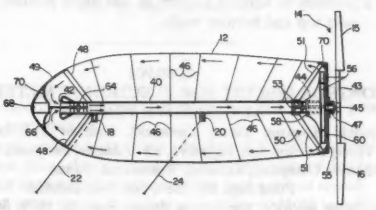
4,350,898
LIGHTER THAN AIR WIND ENERGY CONVERSION SYSTEM UTILIZING AN EXTERNAL RADIAL DISK DIFFUSER
William R. Benoit, 11718 Whittier Rd., Mitchelville, Md. 20716
Filed Oct. 24, 1980, Ser. No. 200,105
Int. Cl.³ F03D 9/00
U.S. Cl. 290—55 **22 Claims**

1. Apparatus, which comprises:
a lighter than air structure;
means supported by said lighter than air structure for generating electricity, said means including a main rotor adapted to be rotated by the wind, a diffuser coupled to rotate with said main rotor, a turbine in fluid communication with said diffuser, and an electrical generator coupled to said turbine; and



means connected between said lighter than air structure and the ground for tethering said structure and for delivering electricity from said generator.

4,350,899
LIGHTER THAN AIR WIND ENERGY CONVERSION SYSTEM UTILIZING A REARWARDLY MOUNTED INTERNAL RADIAL DISK DIFFUSER
William R. Benoit, 11718 Whittier Rd., Mitchelville, Md. 20716
Filed Oct. 24, 1980, Ser. No. 200,106
Int. Cl.³ F03D 9/00
U.S. Cl. 290—55 **22 Claims**

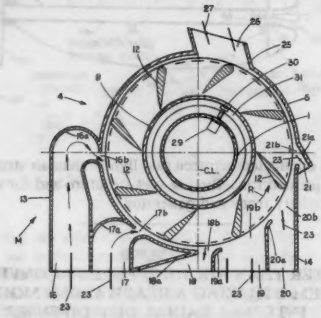


1. Apparatus, which comprises:
a lighter than air structure including an enclosed gas-filled envelope;
means supported by said lighter than air structure for generating electricity, said means including a main rotor adapted to be rotated by the wind, a diffuser mounted within said envelope and coupled to rotate with said main rotor, a hollow duct within said envelope and having an outlet end coupled to said diffuser, a turbine in fluid communication through said duct with said diffuser, and an electrical generator coupled to said turbine; and
means connected between said lighter than air structure and the ground for tethering said structure and for delivering electricity from said generator.

4,350,900
WIND ENERGY MACHINE
Harold E. Baughman, P.O. Box 6506, Santa Rosa, Calif. 95406
Filed Nov. 10, 1980, Ser. No. 205,428
Int. Cl.³ F03D 7/06
U.S. Cl. 290—55 **5 Claims**

1. A rotary machine driven by a flowstream comprising:
a housing having a semi-cylindrical back wall, horizontal top and bottom walls, and a plurality of intake ducts opening across the front thereof;
a cylindrical rotor in said housing;
a plurality of vertical vanes carried on and around said rotor to extend outward therefrom and spaced closely at their ends to said top and bottom walls;
those ducts opening into said housing on one side of a front

to back centerline of said rotor being formed and disposed to direct flow in a rotational direction generally along a chord of the front quadrant of said rotor on said one side, while those ducts on the other side are curved and disposed to bend the stream and direct flow back in said rotational direction generally along a chord of the front quadrant of said rotor on the other side of said centerline;



said vanes being of airfoil configuration and being disposed so that flow over said vanes as directed from said ducts creates aerodynamic forces in said direction of rotation; and

a plurality of vertical louvers in said ducts pivoted between said top and bottom walls.

4,350,901

CONTROL CIRCUIT FOR ELECTRONIC METER IN AN AUTOMOTIVE VEHICLE

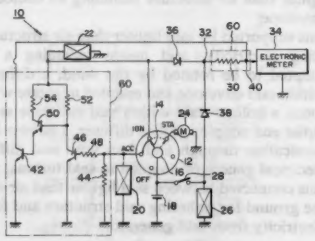
Kouichi Kogawa; Teruo Kawasaki, both of Yokohama, and Hiroyuki Nomura, Fujisawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 19, 1980, Ser. No. 188,856

Claims priority, application Japan, Sep. 25, 1979, 54-121968

Int. Cl.³ B60K *35/00*

U.S. Cl. 307—10 R **9 Claims**



1. A control circuit for an automotive vehicle electronic meter, comprising:

(a) first switching means for selectively supplying power to a first supply circuit;

(b) second switching means for selectively supplying power to a starter motor circuit;

(c) first supply means connected to said first switching means;

(d) cut off means connected to the first switching means and supplying to said meter power supplied independently by the first switching means, but adapted to cut off power from said first supply means when the second switching means supplied power to the starter motor circuit, said cut off means including a resistor connected between said electronic meter and the output of said first supply means; and

(e) means for grounding the junction between said meter and said resistor whenever said second switching means supplies power to said starter motor circuit.

4,350,902

INPUT STAGE FOR A MONOLITHICALLY INTEGRATED CHARGE TRANSFER DEVICE WHICH GENERATES TWO COMPLEMENTARY CHARGE PACKETS

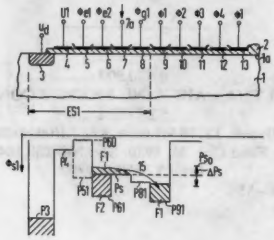
Karl Knauer, Kirchseeon, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 2, 1980, Ser. No. 165,249

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1979, 2936682

Int. Cl.³ G11C *19/28*; H01L *29/78*

U.S. Cl. 307—221 D **4 Claims**



1. In an input stage for generating and supplying two complimentary charge packets to a charge transfer device monolithically integrated on a doped semiconductor body of one conductivity type having an opposite conductivity type (oppositely doped) region disposed in said input stage and covered at a boundary surface with an electrically insulating layer, said input stage having a first gate connected to a constant voltage and an input gate to which an input signal is supplied disposed on said insulating layer, said input stage further having at least two transfer gate electrodes disposed between said first gate and said input gate, and said charge transfer device having a plurality of transfer electrodes respectively connected to phase-displaced clock pulse voltages and disposed on said insulating layer above a transfer channel for said charge transfer device, the improvement of:

a second gate in said input stage disposed between said input gate and said charge transfer device transfer electrodes, said oppositely doped region and said input stage transfer gate electrodes being connected to respective first clock pulse voltages having a clock frequency which is one half of the clock frequency of said phase-displaced clock voltages connected to said charge transfer device transfer gate electrodes.

4,350,903

ELECTRONIC LIGHT SWITCH

Bruce D. Jimerson, 6415 Corsini Pl., Rancho Palos Verdes, Calif. 90274, and Henry H. Nakasone, 1672 Camrose Way, Anaheim, Calif. 92802

Continuation-in-part of Ser. No. 768,544, Feb. 14, 1977, Pat. No. 4,152,608. This application Apr. 27, 1979, Ser. No. 33,864

The portion of the term of this patent subsequent to May 1, 1996, has been disclaimed.

Int. Cl.³ H03K *17/60*; G05F *1/00*

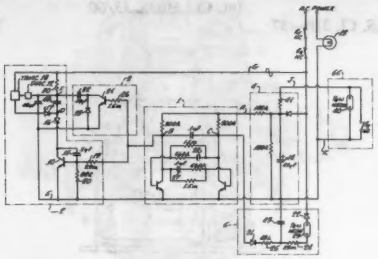
U.S. Cl. 307—252 B **8 Claims**

1. A switching apparatus for operating a load from an A-C power source comprising:

a bistable circuit having a first stable state and a second stable state;

a control device connected in series between the power source and load having a high impedance "off" state and a low impedance "on" state;

circuit means responsively connecting said control device in parallel with said bistable circuit for causing said control device to remain in the "off" state during the time said



bistable circuit is in a first state, and for causing said control device to periodically switch from the "off" state to the "on" state when said bistable circuit is in a second state;

actuating means connected in series with the power source and the parallel combination of said control device and said bistable circuit for momentarily altering the voltage across said parallel combination to cause said bistable circuit to change from one stable state to the other stable state.

4,350,904

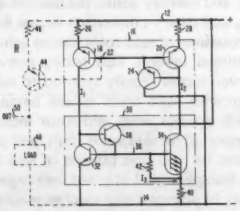
CURRENT SOURCE WITH MODIFIED TEMPERATURE COEFFICIENT

Robert R. Cordell, Tinton Falls, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 22, 1980, Ser. No. 189,045

Int. Cl.³ H03K *3/26, 17/60*

U.S. Cl. 307—310 **12 Claims**



1. An apparatus (10, 52, 54) for generating a controlled current, comprising:

a first current mirror (16) having first and second current transistors (18, 20) of a first junction polarity, each with a base, an emitter, a collector, and a conductive junction area, the emitters being connected through first and second emitter resistors (26, 28) to a first supply voltage means (12);

a second current mirror (30) having third and fourth current transistors (32, 34) of a second junction polarity, opposite to the first polarity, each with a base, an emitter, a collector, and a conductive junction area, the collectors of the first and second current transistors (18, 20) being connected to the collectors of the third and fourth current transistors (32, 34), respectively, to regeneratively couple the first and second current mirrors (16, 30) so that the conductive junction areas of the third and fourth current transistors (32, 34) have unequal current densities, the emitter of the third current transistor (32) being connected to a second supply voltage means (14); and

a current-setting resistor (40) connecting the emitter of the fourth current transistor (34) to the second supply voltage (14); characterized by

a modifying resistor (42, 53, 55) connecting together the base and emitter of one of the first (18), second (20), or fourth (34) current transistors and passing a temperature-dependent modifying current for modifying the temperature dependence of the collector current of the fourth current transistor (34).

4,350,905

COMPLEMENTARY MOS LOGIC DECODER CIRCUIT

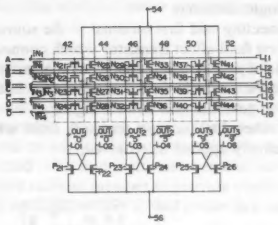
Yasushi Sato, Oita, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 1, 1979, Ser. No. 90,421

Claims priority, application Japan, Jan. 19, 1979, 54-4936

Int. Cl.³ H03K *19/094, 19/173, 19/20, 13/00*

U.S. Cl. 307—451 **5 Claims**



1. a logic circuit to be used with first and second power sources comprising:

first logic means including a plurality of MOS transistors of a first channel type which receives a plurality of first logic input signals and produces a first logic output signal;

second logic means including a plurality of MOS transistors of the first channel type which receives second logic input signals the inverse of said first input signals and produces a second logic output signal, said second logic output signal being the inverse of said first logic output signal;

a first MOS transistor of a second channel type connected between the first power source and an output terminal for the first logic output signal of said first logic means; and

a second MOS transistor of the second channel type connected between the first power source and an output terminal for the second logic output of said second logic means, wherein the gate of said first MOS transistor is connected to the output terminal of said second logic means and the gate of said second MOS transistor is connected to the output terminal of said first logic means so as to form a flip-flop circuit and the first and second logic means being respectively connected between the output terminal and the second power source.

4,350,906

CIRCUIT WITH DUAL-PURPOSE TERMINAL

James E. Gillberg, North Plainfield, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 918,653, Jun. 23, 1978, abandoned. This application Dec. 11, 1979, Ser. No. 102,574

Int. Cl.³ H03K *19/094, 19/20, 19/003, 17/687*

U.S. Cl. 307—469 **6 Claims**

1. A circuit comprising:

a first dual-purpose terminal;

a first field effect transistor of a first conductivity type having gate and drain and source electrodes;

a second terminal for receiving a first supply potential, and

means connecting said second terminal to the gate electrode of said first field effect transistor;

a third terminal for receiving a second supply potential;

a second field effect transistor of a conductivity type complementary to said first transistor and having gate and source electrodes connected respectively to said second and said third terminals and having a drain electrode connected to the drain electrode of said first field effect transistor, said second field effect transistor conditioning said first field effect transistor for conduction between its source and drain electrodes;

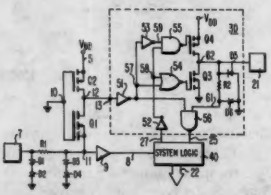
a fourth terminal connected to the interconnection of the drain electrodes of said first and second field effect transistors from which a control signal is available;

system logic circuitry having first and second inputs and an output and being of a type responsive to logic signals swinging over a range between said first and second supply potentials, which logic signals are applied to its inputs;

means capable of passing a logic signal swinging over a range between said first and second supply potentials, connecting said first terminal to the first input of said system logic circuitry;

means connecting said first terminal to the source electrode of said first field effect transistor which connecting means is capable of passing a potential of such polarity and amplitude to condition said first field effect transistor for conduction to generate said control signal;

a fifth, or other dual-purpose terminal, from which signals are selectively applied or received;



third and fourth field effect transistors respectively of the same conductivity types as said first and second field effect transistors and having respective gate and drain and source electrodes;

means connecting the drain electrodes of said third and fourth field effect transistors to said fifth terminal;

means connecting the source electrodes of said third and fourth field effect transistors to said second and third terminals respectively; and

control logic circuitry having a control signal input terminal connected to said fourth terminal and having a plurality of signal paths respectively coupled between said fifth terminal and said second input of said system logic circuitry and said output of said system logic circuitry and the gate electrodes of said third and fourth field effect transistors, which signal paths are selectively conditioned to pass signal upon application of said control signal to said control signal input terminal, said control logic circuitry causing a logic signal developed at said output of said system logic circuitry to control the conduction of said third and fourth field effect transistors when said control signal has a first level, and said control logic circuitry causing a logic signal developed at said fifth terminal to control the logic signal developed at said second input of said system logic circuitry and simultaneously causing said third and fourth field effect transistors to be rendered non-conductive when said control signal has a second level.

4,350,907

THERMALLY SENSITIVE PRINTER

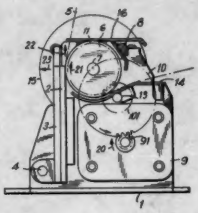
Takemasa Shindo; Yoshikazu Ito, and Kenichiro Arai, all of Shiojiri, Japan, assignors to Shinshu Seiki Kabushiki Kaisha and Kabushiki Kaisha Suwa Seikosha, both of Tokyo, Japan

Continuation of Ser. No. 847,351, Oct. 31, 1977, abandoned, which is a division of Ser. No. 708,953, Jul. 26, 1976, Pat. No. 4,088,214. This application May 27, 1980, Ser. No. 153,651

Claims priority, application Japan, Jul 25, 1975, 50-91289

Int. Cl.³ H02K *33/00*

U.S. Cl. 310—37 **7 Claims**



1. A rotating drive assembly comprising in combination a permanent magnet rotor means adapted to be rotated from a first predetermined position, said rotor means having a rotor shaft and diametrically and magnetically opposed poles secured to said shaft, and stator means including a stator pole disposed proximate to at least one of said rotor poles when said rotor means is at said first predetermined rotary position, the attractive force between said stator pole and said rotor means normally positioning said rotor means in said first predetermined rotary position, coil means surrounding said stator pole for selectively referencing said stator pole to a magnetic polarity sufficient to effect, in opposition to said attractive force, a rotation less than 90 degrees of said rotor means from said first predetermined rotary position to a second predetermined rotary position, said rotor means being adapted to return to said first predetermined position by said attractive force between said rotor means and said stator pole when said coil means is deenergized, and thereby define the oscillatory rotation of said rotor means, and rotary conversion means for converting said oscillatory rotations of said rotor means into a one-way intermittent rotational motion, said rotary conversion means including a lever means fixedly secured to said rotor shaft for rotation therewith, said lever means having at least a first portion which extends from said rotor means, ratchet means rotatably supported on said rotor shaft, and pawl means pivotably supported on said first portion of said lever means, said pawl means being adapted to pivot into engagement with said ratchet means to advance said ratchet means when said lever means is driven in a first rotational direction in response to each rotation of said rotor means from said first predetermined rotary position, said ratchet means being adapted to remain in said advanced rotary position in response to a return of said rotor means and said lever means to said first predetermined rotary position.

4,350,908

COOLING SYSTEM FOR ROTOR OF A DYNAMOELECTRIC MACHINE

Delmar R. Riffe, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 4, 1980, Ser. No. 213,694

Int. Cl.³ H02K *1/32*

U.S. Cl. 310—61 **6 Claims**

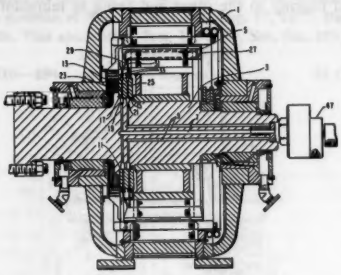
1. A cooling system for a rotor of a dynamoelectric machine, said cooling system comprising.

at least one duct for cooling fluid disposed in a central portion of said rotor;

a plurality of conduits for cooling fluid disposed in windings in peripheral portion of said rotor;

said rotor having a plurality of steps disposed on the central portion thereof;

a disc formed from electrical insulating material and having a central bore and a counterbore which has a diameter and depth that registers with one of said steps which has a riser;



a plurality of ports disposed in said disc and extending radially therethrough;

said ports being in fluid communication with said duct;

a plurality of tubular members in fluid communication with said ports and said conduits; and

sealing means disposed at the interface of said bore in said disc and said riser of said one step to form a cooling system for the rotor which electrically isolates the central portion of the rotor from the windings.

4,350,909

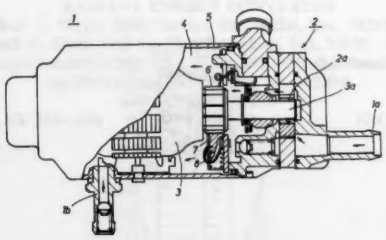
BRUSH LEAD STRUCTURE FOR MOTOR-IMMERSED FUEL PUMPS

Masahide Yamada, Azumamura, Japan, assignor to Mitsuba Electric Mfg. Co., Ltd., Gunma, Japan

Filed Mar. 17, 1980, Ser. No. 130,940

Int. Cl.³ H01R *39/36;* H02K *13/00*

U.S. Cl. 310—62 **8 Claims**



1. In a fuel pump in which a motor for driving the pump is completely immersed in the flow of fuel, the motor having a commutator, at least one sintered carbon brush in sliding contact with said commutator of said motor, and a lead wire connected to said brush, a portion of said lead wire being exposed to said fuel when said pump is in situ, the improvement wherein said exposed portion of said lead wire is composed of a material non-reactive with said fuel and the connection between said lead wire and said brush is formed by planting one end of said lead wire in said brush, said material non-reactive with said fuel being thick enough to resist the sintering temperature but thin enough to give flexibility such that the sliding contact between said brush and said commutator may be maintained even if said brush is gradually worn out.

4,350,910

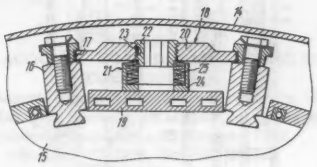
ELECTRICAL MACHINE STATOR

Garry M. Khutoretsky, ulitsa Altaiskaya, 20, kv. 5; Jury G. Tjurin, ulitsa Rudneva, 11, kv. 56; Larisa A. Drozdova, prospekt K. Marxa, 25, kv. 26, and Tamara N. Belova, ulitsa Budapeshtskava, 3, korpus 2, kv. 138, all of Leningrad, U.S.S.R.

Filed Aug. 27, 1981, Ser. No. 296,877

Int. Cl.³ H02K *9/00*

U.S. Cl. 310—64 **1 Claim**



1. An electrical machine stator comprising:

a core,

coolers,

detachable resilient fastening means adapted to attach said coolers to the outer lateral surface of said core,

each of said detachable resilient fastening means including a rigid member attached to said core, a resilient member mounted on said cooler, and an adjusting means movably connected with said rigid member and being in contact with said resilient member to provide continuous pressing of said resilient member to said cooler in a radial direction.

4,350,911

TANDEM CONNECTED SUBMERSIBLE OIL WELL PUMP MOTORS

Brown L. Wilson, and Joseph T. Carle, both of Tulsa, Okla., assignors to Oil Dynamics, Inc., Tulsa, Okla.

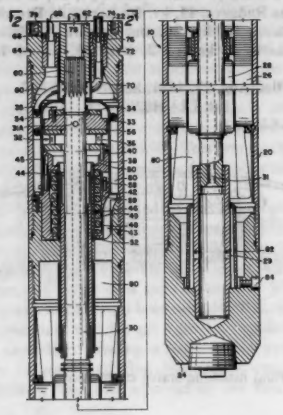
Filed Jun. 4, 1979, Ser. No. 45,312

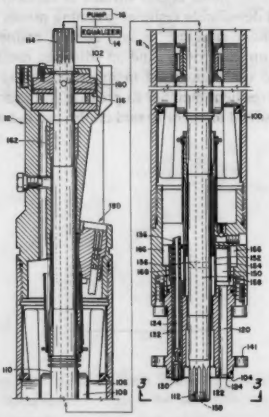
Int. Cl.³ F04D *13/08;* H02K *7/08*

U.S. Cl. 310—87 **20 Claims**

1. In a submersible motor assembly used to drive a pump for pumping fluids from wells having, tandemly arranged, a lower motor assembly and an upper motor assembly, each motor assembly having a longitudinal housing with top and bottom ends, an electric motor, rotor-driven longitudinal shaft, thrust bearings supporting the shaft, oil corridor means within the shaft, and housing to permit the circulation of oil contained within the housing caused by the rotation of the shaft, and internal electrical leads to the motor and splined connection for the shafts, the improvement characterized by:

seal means closing the bottom end of the upper motor assembly oil corridor, and





means, as the bottom end of the upper motor assembly is connected to the top end of the lower motor assembly, to open the seal and interconnect the corridor means.

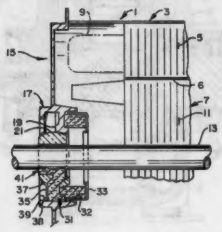
4,350,912

WICK LUBRICATION SYSTEM FOR SELF-ALIGNING BEARING

Stephen J. Burton, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 3, 1980, Ser. No. 126,992
Int. Cl.³ H02K *5/16*
U.S. Cl. 310—90 **5 Claims**

1. In a dynamoelectric machine having a stator, and a rotor, the latter having a rotor shaft, said stator including means for journalling said rotor shaft including a bearing support and a bearing for receiving said shaft and journalling said shaft with respect to said bearing support, said bearing having an outer surface engageable with said bearing support and an inner bore for reception of said shaft, said bearing support including a reservoir wick for holding a supply of lubricant, wherein the improvement comprises: a slot in said bearing, a first portion of said slot opening into said bore and extending longitudinally the length of said bearing, said bearing further having a bridge spaced radially outwardly from said bore joining the portions of said bearing on opposite sides of said slot, said bridge extending longitudinally of said bearing only a portion of the longitudinal dimension of said bearing with another portion of said slot extending radially through the bearing from said bore to said outer surface thereof, and a lubricant applying wick received within said slot, said lubricant applying wick having a first portion thereof disposed in said first portion of said slot, said first wick portion extending longitudinally from one end of said bearing to the other and being in lubricant applying



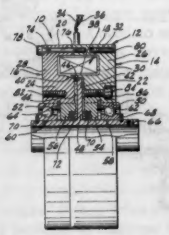
engagement with the entire length of said shaft received within said bearing bore, said lubricant applying wick further having a second portion disposed within said other portion of said slot and extending generally radially outwardly from said first portion, said lubricant applying wick being held captive between said bearing support and said bridge of said bearing, said lubricant applying wick being in lubricant transfer relation with said lubricant reservoir wick whereby lubricant from said lubricant reservoir wick is transferred to said lubricant applying wick for the continuous application of lubricant to the entire length of said shaft received within said bearing.

4,350,913

MAGNETIC PARTICLE DEVICES

Gerald R. Eddens, St. Louis County, Mo., assignor to W. J. Industries, Incorporated, Fenton, Mo.

Filed Aug. 13, 1980, Ser. No. 178,075
Int. Cl.³ H02K *49/00*
U.S. Cl. 310—103 **13 Claims**



1. A housing for a magnetic particle device comprising first and second housing members adapted to be assembled in side-by-side axial relation, at least one of said housing members having an annular cavity formed extending inwardly on the side thereof adjacent to the other housing member, an annular tapered surface formed on the side of one of said housing members at an intermediate location radially of the annular cavity, a sidewardly extending annular flange formed on the other housing member for engaging the annular tapered surface at an intermediate location thereon to divide the annular cavity into inner and outer cavity portions separated by the annular flange, and means connecting the first and second housing members including means to force the annular flange

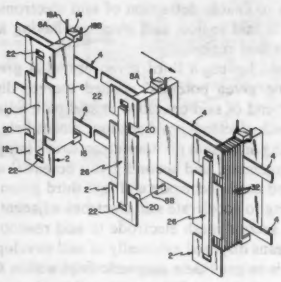
to move axially against and be deformed by engagement with the annular tapered surface to form a seal between the cavity portions.

4,350,914

ELECTRIC MOTOR MANUFACTURE

Robert F. Searle, Amherst, N.H., assignor to Vibrac Corporation, Amherst, N.H.

Continuation of Ser. No. 972,780, Dec. 26, 1978, abandoned, which is a division of Ser. No. 825,207, Aug. 17, 1977, Pat. No. 4,182,026. This application Jun. 13, 1980, Ser. No. 159,134
Int. Cl.³ H02K *19/26*
U.S. Cl. 310—194 31 Claims



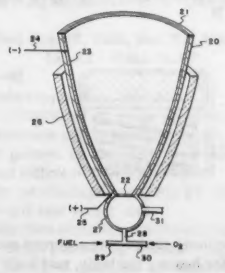
1. A stator assembly for an electric motor comprising:
a housing with a plurality of slots;
an array of pole pieces of magnetic material disposed within said housing in said slots;
a plurality of bobbins connected by integral stringer means, each bobbin surrounding one of said pole pieces;
a plurality of coils each surrounding one of said bobbins;
terminal means connected to said coils for coupling said coils to a source of electrical power; and
means for holding said pole pieces fixed to said housing;
said housing being adapted to provide a low reluctance path between said pole pieces.

4,350,915

RADIANT ENERGY CONVERTER

William G. Wyatt, 8366 Garland Rd., Dallas, Tex. 75218, and Jack H. Shaw, 1715 Baylor, Richardson, Tex. 75081

Continuation of Ser. No. 727,124, Sep. 27, 1976, abandoned. This application Apr. 3, 1978, Ser. No. 892,686
Int. Cl.³ H01V *45/00*
U.S. Cl. 310—306 12 Claims



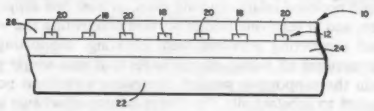
1. A radiant energy converter comprising
(a) means for collecting and concentrating radiant energy, said means comprising a hollow body with divergent reflective sides defining an entrance aperture and an exit aperture of limited area and adapted to collect and concentrate radiant energy and direct the concentrated radiant energy in a first direction through said exit aperture of limited area, and
(b) means for passing a fluid through said exit aperture in substantially the opposite direction whereby said radiant energy is at least partially absorbed by said fluid passing through said exit aperture.

4,350,916

SURFACE ACOUSTIC WAVE DEVICE HAVING BURIED TRANSDUCER

Rudolf R. August, Laguna Beach; Dean B. Anderson, Whittier, and Shi-Kay Yao, Anaheim, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 27, 1980, Ser. No. 163,533
Int. Cl.³ H03H *9/32*
U.S. Cl. 310—313 B 18 Claims



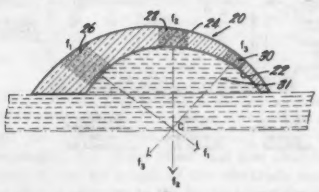
1. An acoustic wave device, comprising:
a substrate;
a first layer of piezoelectric material disposed on said substrate;
a first electrode for an interdigital acoustic wave transducer disposed on said first layer; and
a second layer of piezoelectric material disposed over said first layer of piezoelectric material and said first electrode,
whereby said first electrode is interposed between said first and second layers of piezoelectric material.

4,350,917

FREQUENCY-CONTROLLED SCANNING OF ULTRASONIC BEAMS

Frederic L. Lizzi, Tenafly, N.J., and Kurt W. Weil, New York, N.Y., assignors to Riverside Research Institute, New York, N.Y.

Filed Jun. 9, 1980, Ser. No. 157,417
Int. Cl.³ H03J *3/28;* H03H *9/40;* A61B *10/00*
U.S. Cl. 310—320 27 Claims



27. Apparatus for radiating acoustic signals, comprising a radiating aperture, resposive to acoustic signals of different frequencies, for radiating said signals into different directions in an unbounded region of space from said aperture, the direction of radiation being determined by the frequency of said signal, and means for supplying acoustic signals to said radiating aperture.

4,350,918
CONTOUR VIBRATION MODE PIEZOELECTRIC RESONATOR

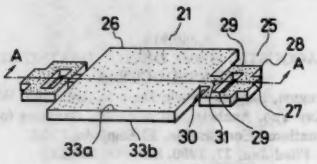
Hirochika Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Oct. 24, 1979, Ser. No. 87,751

Claims priority, application Japan, Dec. 21, 1978, 53-160737; Dec. 22, 1978, 53-160571

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—367 **24 Claims**



1. A contour vibration mode piezoelectric resonator comprising: a vibrating portion having opposed relatively short sides and opposed relatively long sides, at least one supporting portion, and at least one bridge portion connecting the vibrating and supporting portions; said vibrating, supporting and bridge portions all being integrally formed as a single piece; wherein the supporting portion comprises a resilient portion connected to substantially the center of one short side of the vibrating portion through said bridge portion, an attenuation portion connected to said resilient portion, and a fixing portion connected to or forming a part of the attenuation portion; and wherein the relationship between the width W of the short side of the vibrating portion, the width W_0 of the bridge portion, and the length L_1 and the width W_1 of the resilient portion is represented by:

$$0.015 \leqq (W_0/W) \leqq 0.200, \text{ and}$$

$$5 \leqq (L_1/W_1) \leqq 25.$$

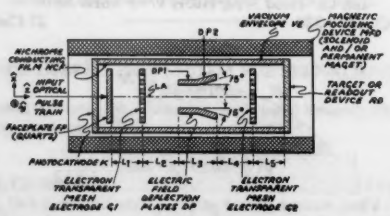
4,350,919
MAGNETICALLY FOCUSED STREAK TUBE

Charles B. Johnson, and Jimmy M. Abraham, both of Fort Wayne, Ind., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 834,591, Sep. 19, 1977, abandoned, which is a continuation of Ser. No. 708,813, Jul. 26, 1976, abandoned. This application Oct. 5, 1978, Ser. No. 948,849

Int. Cl.³ H01J *40/04, 31/50*

U.S. Cl. 313—99 **33 Claims**



1. A magnetically focused streak tube arrangement comprising:

a vacuum envelope having a longitudinal axis and a light input faceplate disposed coaxially of said axis at one end of said envelope;

first means having a first given potential applied thereto disposed coaxial of said axis within said envelope adjacent said faceplate responsive to an optical pulse train to emit electrons into said envelope in a direct proportion to incident photon flux of said pulse train;

a first electron transparent mesh electrode having a second given potential greater than said first given potential applied thereto disposed within said envelope, coaxial of said axis and adjacent said first means to rapidly accelerate said emitted electrons away from said first means in a path parallel to said axis toward the other end of said envelope;

a second electron transparent mesh electrode having said second given potential applied thereto disposed within said envelope, coaxial of said axis and adjcent said other end of said envelope, said second given potential applied to said first and second mesh electrodes providing a region of constant potential between said first and second mesh electrodes to enable deflection of said electrons adjacent said path in said region, said electrons having a constant velocity in said region;

readout means having a third given potential greater than said second given potential applied thereto disposed in said other end of said envelope in said path adjacent said second mesh electrode, said readout means being capable of providing an output photoelectron streak image for said tube arrangement, said second given potential applied to said second mesh electrode and said third given potential cooperating to accelerate said electrons adjacent said path from said second mesh electrode to said readout means;

magnetic means disposed externally of said envelope coaxial of said axis to provide a magnetic field within said envelope substantially parallel to said path to focus said electrons on said readout means; and

a pair of deflection plates each disposed within said envelope equally spaced from said path between said first and second mesh electrodes in said region to produce an electric field substantially perpendicular to said magnetic field to deflect said focused electrons across said readout means to produce said output streak image on said readout means.

4,350,920
DISPENSER CATHODE

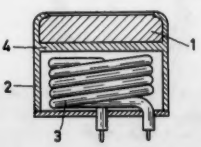
Theodorus C. J. M. Bertens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 3, 1980, Ser. No. 165,893

Claims priority, application Netherlands, Jul. 17, 1979, 7905542

Int. Cl.³ H01J *1/14, 19/06;* H01K *1/04*

U.S. Cl. 313—346 R **4 Claims**



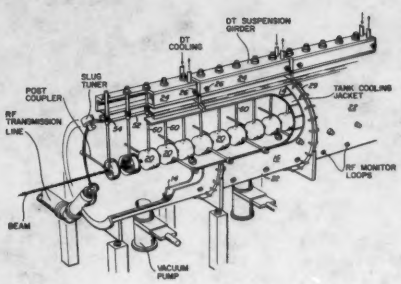
1. A dispenser cathode comprising a porous metal body and a heating element for heating the body, said body including an emissive surface and having a material in its pores for dispensing barium, barium oxide and scandium oxide when the cathode is heated, said material consisting essentially of $Ba_2Sc_2O_5$ constituting 1–15% by weight of the body, said material consisting essentially of 68–72% by weight of BaO and 32–28% by weight of Sc_2O_3.

4,350,921

DRIFT TUBE SUSPENSION FOR HIGH INTENSITY LINEAR ACCELERATORS

Donald J. Liska; Roger G. Schamaun; Donald C. Clark; R. Christopher Potter, and Joseph A. Frank, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 11, 1980, Ser. No. 129,299
Int. Cl.³ H05H *9/00*
U.S. Cl. 313—360.1 **3 Claims**



1. A drift tube suspension apparatus for linear accelerators housings comprising:

a plurality of inverted box-section suspension girders;

suspended from each of said girders, a plurality of drift tube stems having longitudinal axes of rotation, a drift tube being attached to one end of each of said stems and each of stems at its other end being supported by said girder;

means for rotating each of said stems about its longitudinal axis of rotation;

means for raising and lowering each of said stems in a first "Y" direction;

means for moving each of said tubes in second and third directions, "X" and "Z";

means comprising radiofrequency degradation resistant bellows disposed about each stem for vacuum sealing said apparatus to said accelerator housing; and

means for aligning said plurality of said girders on said housing.

4,350,922

MULTICOLOR CATHODE-RAY TUBE WITH QUADRUPOLAR FOCUSING COLOR-SELECTION STRUCTURE

Carmen A. Catanese, Rocky Hill, and Stanley Bloom, Bridgewater, both of N.J., assignors to RCA Corporation, New York, N.Y.

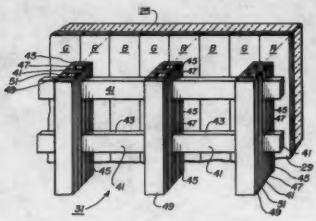
Filed Jun. 20, 1980, Ser. No. 161,603
Int. Cl.³ H01J *29/07*
U.S. Cl. 313—402 **10 Claims**

1. In a cathode-ray tube including

(a) a target comprising an array of phosphor elements of different emission colors arranged in cyclic order in adjacent color groups, each group comprising an element of each of said different emission colors,

(b) means for producing a plurality of electron beams directed toward said target, and

(c) a color-selection structure positioned between said target and said beam-producing means, said color-selection structure having a plurality of means for transmitting portions of said beams to associated color groups of said target and means for focusing without deflecting said beam portions, said structure comprising (i) a metal masking plate having two opposed major surfaces and having therein an array of substantially rectangular windows, each window having associated therewith (ii) a pair of first conductors insulatingly spaced from one major surface of said masking plate and located adjacent opposite sides of said window, each window being associated with only one color group,



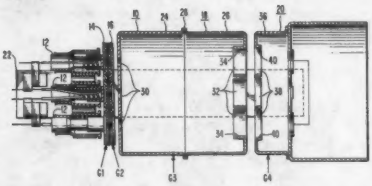
the improvement wherein said color-selection structure includes (iii) a pair of second conductors insulatingly spaced from the other major surface of said plate and located adjacent opposite sides of each of said windows.

4,350,923

ELECTRON GUN WITH BALANCED LENS LIPS TO REDUCE ASTIGMATISM

Richard H. Hughes, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 27, 1980, Ser. No. 134,641
Int. Cl.³ H01J *29/50*
U.S. Cl. 313—414 **4 Claims**



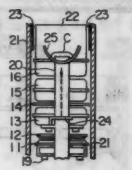
1. In an in-line electron gun for use with an astigmatic self-converging magnetic deflection yoke located beyond an output end of said gun, said gun including two lens electrodes, by which an astigmatic electrostatic focus field is established in operation of said gun, each of said electrodes, including an elongated tub with 3 in-line apertures in the floor thereof facing the other of said electrodes, with each of said apertures of each of said electrodes having a tubular lip extending from the periphery of the aperture in a direction away from the other of said electrodes, said electrodes by virtue of their elongated tub shape producing the astigmatism in said focus field, the astigmatism of said yoke causing vertical overconvergence and horizontal underconvergence of the electron beams at maximum deflection of the yoke, the improvement comprising

the lips of the lens electrode farthest from the output end of said gun having lengths that are less than half the diameter of their associated apertures and being longer than the corresponding lips of the other said lens electrode with the ratio of the lip length of the electrode nearest the output end of said gun to the lip length of the electrode farthest from said gun being in the range of 0.30 to 0.70 and being such as to make said astigmatism in said focus field of opposite polarity to that of said yoke to be of such value as to partially compensate for the yoke astigmatism at maximum beam deflection, and to produce electron beams at the output end of said gun which are vertically under-focused and horizontally over-focused.

4,350,924
COLOR PICTURE TUBE

Masayoshi Misono, Choseimura, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 16, 1979, Ser. No. 85,254
Int. Cl.[3] H01J *29/46*
U.S. Cl. 313—441 9 Claims

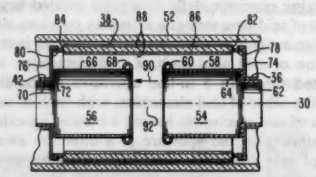


1. A color picture tube with an in-line multi-stage focusing type electron gun assembly including an envelope having a neck tube; a group of electrodes contained in the neck tube and having a successive arrangement including a cathode electrode, at least one grid electrode to which is applied a focusing voltage and at least one grid electrode to which is applied an anode voltage; bead glass means for supporting these electrodes at predetermined spacings; an inner graphite coating formed on the inner wall of the neck tube and to which is applied the anode voltage; a shield cup secured and electrically connected to said grid electrode to which is applied the anode voltage; and metallic shielding means for electrostatically shielding said inner graphite coating from the electrodes which are at potentials lower than the anode voltage, said metallic shielding means being at the anode voltage level and being located nearer to the base of said electron gun assembly as compared with the distance between said base and said inner graphite coating.

4,350,925
MAIN LENS ASSEMBLY FOR AN ELECTRON GUN

Frank D. Marschka, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 9, 1980, Ser. No. 167,050
Int. Cl.[3] H01J *29/06, 29/82, 29/62*
U.S. Cl. 313—451 4 Claims



1. In an electron gun including an electron beam source and at least two spaced apart successive electrodes having coaxially aligned apertures therein for passing an electron beam therethrough, the improvement comprising:

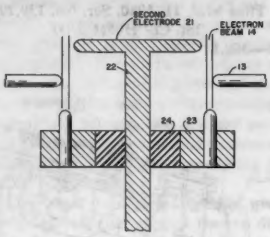
a ceramic cylinder having interior and exterior surfaces and oppositely disposed ends, said cylinder having a resistive coating uniformly disposed on at least said interior surface thereof, said resistive coating contacting each of said oppositely disposed ends, and

electrically conductive support means for attaching one of said successive electrodes to one of said oppositely disposed ends of said cylinder and another of said successive electrodes to another of said oppositely disposed ends, said support means being in contact with said resistive coating and said electrodes being spaced from, disposed concentric with and substantially within said ceramic cylinder.

4,350,926
HOLLOW BEAM ELECTRON SOURCE

Joe Shelton, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 28, 1980, Ser. No. 172,803
Int. Cl.[3] H01J *29/46, 29/56*
U.S. Cl. 313—455 2 Claims



1. A hollow beam electron source comprising a disk shaped field emitter; an emitting surface on said emitter which covers an entire area of one side of said emitter; an anode positioned spacially to said emitter and having a circular-shaped aperture therein positioned to the emitter such that a hollow beam electron flow will occur upon applying a predetermined potential of voltage between said emitter and said anode a further circular disc-shaped electrode positioned relative to said anode and said emitter such that it is positioned within the hollow beam emission and is farther from said emitter than said anode is from said emitter; and said further electrode is positioned such that when a predetermined voltage between said further electrode and emitter is present, emissions from the emitter will not be initiated but the hollow beam emissions initiated by the electrodes will be shaped by the potential applied to the further electrode; said emitter being a cold cathode field emitter which has over a million emitting sites in each square centimeter; and an electric field being formed by said emitter and said anode such that the field is concentrated about the outer edge of the emitter such that emitting sites towards the center of the emitter will not emit, while the sites toward the outer edge will emit.

4,350,927
MEANS FOR THE FOCUSING AND ACCELERATION OF PARALLEL BEAMS OF CHARGED PARTICLES

Alfred W. Maschke, East Moriches, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 152,461, May 23, 1980. This application Sep. 23, 1980, Ser. No. 189,990
Int. Cl.[3] H01J *25/10*
U.S. Cl. 315—5.41 10 Claims

1. Apparatus for electrostatically focusing a beam of charged particles, comprising:

(a) a first support plate, the first plate including a first plurality of holes, and

(b) a first plurality of pairs of substantially identical projections to serve as electrostatic poles for focusing the beam located on one side of the first plate the poles of each of the pairs are on diametrically opposite sides of a corresponding one of the holes and spaced equidistant from the center of the hole, so that each hole corresponds with a single pair of poles.

9. A method for electrostatically focusing a plurality of parallel beams comprising the steps of:

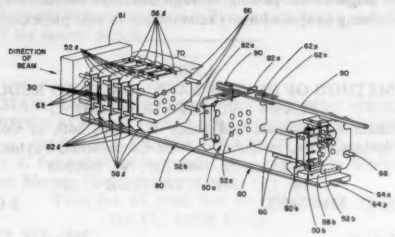
(a) supplying a first conducting support plate having a plurality of conducting projections to serve as electrostatic focusing poles, the poles being located on one side of the plate, and being positioned in parallel rows spaced uni-

formly apart, the poles in the rows having the same spacing between poles as between rows, the plate having a hole centrally located between each pole in each row,

(b) supplying a second plate identical to the first,

(c) locating the plates parallel to one and other,

(d) orienting the rows on the first plate orthogonal with respect to those on the second,



(e) aligning the centers of each pair of corresponding holes on opposite plates on an axis lying perpendicular to the plates,

(f) intermeshing the poles without making contact between the poles and the opposite plate and maintaining each of the hole pairs on the axis, and

(g) applying DC potential to the poles by way of supplying opposite polarity to the first and second plate to produce a focusing field on beams passing through the hole pairs.

4,350,928

CROSSED FIELD RE-ENTRANT BEAM AMPLIFIER

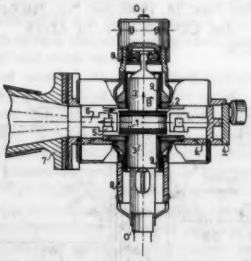
Pierre Couennault, and Lucien Teyssier, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 9, 1980, Ser. No. 138,503

Claims priority, application France, Apr. 13, 1979, 79 09490

Int. Cl.³ H01J *25/34*

U.S. Cl. 315—39.3 **6 Claims**



1. A crossed field, re-entrant beam amplifier comprising in a vacuum enclosure a substantially cylindrical cathode, provided with two supports, and a delay line which surrounds most of the cathode, a parasitic cavity resonator constituted by the vacuum enclosure, the cathode and its supports and the delay line means ensuring the reduction of the resonance ratio of the cavity resonator, said means being constituted by a material which absorbs microwaves which is applied to the walls of the cavity resonator level with at least one of the two supports of the cathode.

4,350,929

FLUORESCENT LIGHTING DEVICE

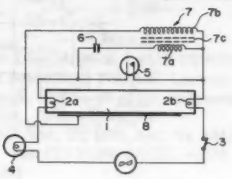
Masayuki Katoogi, Tokyo, Japan, assignor to Moriyama Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1979, Ser. No. 100,001

Claims priority, application Japan, Dec. 6, 1978, 53-151800; Jan. 14, 1979, 54-3497; Mar. 13, 1979, 54-28860; Jul. 4, 1979, 54-84742

Int. Cl.³ H01J *7/44, 13/46, 19/78, 29/96*

U.S. Cl. 315—49 **15 Claims**



1. A fluorescent lighting device, comprising:

(a) a fluorescent discharge tube having preheating electrodes and an outer wall including auxiliary electrode means adjacent thereto;

(b) resistive stabilizing means connected in series with said preheating electrodes;

(c) a bimetal glow bulb igniter coupled across the preheating electrodes of said discharge tube, a preheating current flowing through said preheating electrodes, resistive means and igniter to preheat said discharge tube;

(d) a capacitor, said capacitor minimizing propagation of electromagnetic noise radiated by said igniter into the environment surrounding said lighting device; and

(e) a pulse transformer having a low voltage primary coil and a high voltage secondary coil, the primary coil of said pulse transformer being connected in series with said capacitor and said secondary coil being connected to said auxiliary electrode means, said series-connected capacitor and primary coil being connected in parallel with said glow bulb igniter, the primary coil of said pulse transformer having a high frequency surge voltage induced therein upon termination of said preheating current and said secondary coil applying a stepped-up high voltage to said auxiliary electrode means thereby initiating a discharge within said discharge tube.

4,350,930

LIGHTING UNIT

William Peil, North Syracuse, and Robert J. McFadyen, Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Continuation-in-part of Ser. No. 47,972, Jun. 13, 1979, abandoned. This application Jun. 4, 1980, Ser. No. 156,229

Int. Cl.³ H01J *7/44, 17/34, 19/78, 29/96*

U.S. Cl. 315—49 **44 Claims**

1. A lighting unit comprising:

A. a dc power source having two output terminals, one a reference terminal,

B. a metal vapor arc discharge lamp requiring energization dependent on its electrical state, and

C. an operating network comprising:

(1) an incandescible resistive filament exhibiting a substantial resistance increase with applied voltage to provide standby light for said lamp,

(2) alternating electrical energy transforming means for coupling a stepped up output voltage to said lamp,

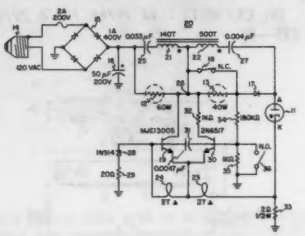
(3) switching means,

(4) interconnecting means for coupling current from said dc source

(a) in a dc form to said filament and said lamp in series for

energizing and ballasting said lamp, the dissipation in said filament being too low to produce useful light during normal running operation of said lamp, when said switching means is in a stable first condition, and

(b) in a periodic form to said resistive filament and switching means in series for producing useful light and in a periodic form to the input of said transforming means



for starting said lamp, when said switching means is in an astable, second condition, and

(5) means responsive to the electrical conditions of said lamp for maintaining said switching means in said first condition during warm-up and normal running operation of said lamp, and in said second condition during other operating states of said lamp.

4,350,931

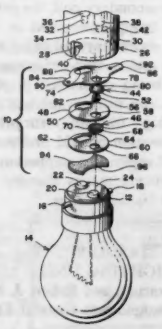
LIGHT SAVER DEVICE

Shale J. Niskin, 3415 Chase Ave., Miami Beach, Fla. 33140

Filed Jan. 8, 1981, Ser. No. 223,397

Int. Cl.[3] H01J *7/44;* H05B *37/00*

U.S. Cl. 315—72 **5 Claims**



1. A light saving device for use with a bayonet-type lamp and electrical socket, said light saving device comprising:

first and second plate contacts;

a diode positioned between and being held by holding portions of said plate contacts to electrically couple together said plate contacts when said diode is in its conductive state;

three sheets of plastic insulating material, a first sheet, a second sheet, and a third sheet, being positioned on top of each other and being heat bonded to each other, with said first sheet being in the middle;

said first plate contact being immovable encased between said first sheet and said second sheet, said second plate contact being immovably encased between said first sheet and said third sheet;

at least one of said sheets having a pair of opposed tabs integrally formed therein, each tab having an aperture formed therein;

said second and third sheets each having a contact-receiving hole formed therein which is positioned to expose a portion of the adjacent said plate contact, said exposed portions of said plate contacts being spaced apart from said holding portions of said plate contacts, whereby said diode will be protected when said light saving device is in use;

each of said three sheets having an aligned hole formed therein, said three aligned holes being arranged to form a single cutout passing through said three sheets, said cutout being in spaced-apart relationship to said plate contacts.

4,350,932

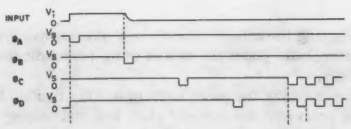
METHOD OF PLASMA PANEL DRIVE TO REDUCE FLASH AND CREATE DIMMING

William E. Coleman, and Stacy W. Hall, both of Colorado Springs, Colo., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 20, 1980, Ser. No. 198,562

Int. Cl.[3] G09F *9/313;* H05B *41/00*

U.S. Cl. 315—169.2 **5 Claims**



1. A method for suppressing the visual flash associated with replacing patterns in a "plasma-charge-transfer" shift mechanism type AC plasma shift display panel, comprising the steps of:

reducing the phase voltage repetition rate during the load segment of the operating sequence until the time average luminous flux is substantially unperceivable in a room ambient light background; and

increasing the phase voltage repetition rate during the hold segment of the operating sequence until the time average luminous flux is visually perceivable in a room ambient light background.

4,350,933

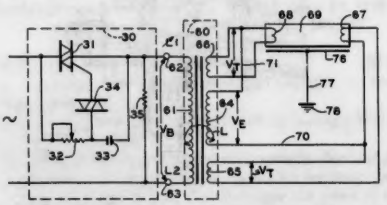
TWO-WIRE BALLAST FOR FLUORESCENT TUBE DIMMING

Poonam Agarwala, St. Paul, and Zoltan Zansky, Roseville, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 26, 1980, Ser. No. 210,649

Int. Cl.[3] H05B *41/16, 41/39*

U.S. Cl. 315—278 **5 Claims**



1. A two-wire ballast for a fluorescent tube dimming arrangement comprising:

first and second terminals adapted to be connected to source of variable power;

a transformer having a primary winding connected across said first and second terminals said transformer further comprising,

first secondary winding having terminals connected across the filaments of a fluorescent tube,

second secondary winding having terminals connected across one of said fluorescent filaments,

third secondary winding having terminals connected across the other of said fluorescent filaments, and

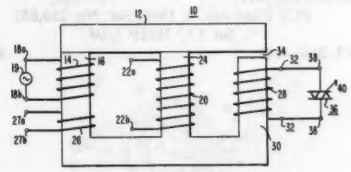
wherein said second and third secondary windings are disposed in predetermined spaced relation to said primary winding and said first secondary winding such that the leakage inductance ratios produced by the disposition of said second and third secondary windings causes the cathode heating voltage supplied to said fluorescent tube filaments to remain substantially constant during variation of the source power.

4,350,934

DISCHARGE DEVICE BALLAST COMPONENT WHICH PROVIDES BOTH VOLTAGE TRANSFORMATION AND VARIABLE INDUCTIVE REACTANCE

Robert J. Spreadbury, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 23, 1980, Ser. No. 171,589
Int. Cl.³ H05B *41/16*
U.S. Cl. 315—282 **8 Claims**



1. A composite structure which provides the functions of AC line voltage transformation as well as inductive reactance which can be controllably shifted in value, said structure having utility as a part of ballasting apparatus for a high-intensity gas-discharge device, said structure comprising:

(a) a multileg magnetic core member of predetermined dimensions, a primary winding having a predetermined number of turns carried on a first leg portion of said core member, said primary winding having input terminals adapted to be connected to an energizing source of AC potential of predetermined magnitude and frequency;

(b) an output winding having output terminals adapted to be connected in series circuit with said device to be operated, said output winding having a predetermined total number of turns to provide a predetermined output voltage, and at least a substantial and predetermined proportion of said total turns of said output winding carried on a second leg portion of said core member;

(c) a control winding having a predetermined number of turns carried on a third leg portion of said core member, said control winding having input terminals and said control winding being unconnected to said primary winding or said output winding, non-magnetic gap means of predetermined dimensions provided in the magnetic path which includes said third leg portion, and said magnetic core member and said windings carried thereon having leakage flux paths of predetermined total permeance;

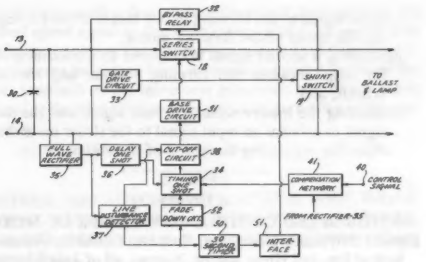
(d) bilateral switch means having output terminals and a control terminal, said bilateral switch means having an open non-conducting state and a closed conducting state, said control winding input terminals connect to the output terminals of said bilateral switch means, and during normal operation of said ballasted device said bilateral switch means is operable to be driven from an open non-conducting state to a closed conducting state at a variable but predetermined time in each half cycle of AC energizing potential; when said bilateral switch means is in an open non-conducting state, a first predetermined value of inductive reactance is effectively provided in series with said ballasted device as normally operating as determined by both the magnetic path through said third leg portion and the flux in said leakage flux paths in order to limit the current through said operating device to a first predetermined value; and when said bilateral switch means is in a closed conducting state, said third leg portion is effectively removed from circuit by virtue of the counter mmf generated therein with the flux in said leakage flux paths effectively providing a second predetermined value of inductive reactance in series with said ballasted device as normally operated to limit the current therethrough to a second predetermined value.

4,350,935

GAS DISCHARGE LAMP CONTROL

Joel S. Spira, Coopersburg; David G. Luchaco, Macungie, and Dennis Capewell, Easton, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Mar. 28, 1980, Ser. No. 135,091
Int. Cl.³ H05B *41/392, 41/16*
U.S. Cl. 315—291 **84 Claims**



1. An illumination control system comprising:

a gas discharge lamp;

an a-c ballast means having a high power factor connected to said lamp and having a-c ballast input terminals;

a control circuit having input a-c terminals and output a-c terminals; said output a-c terminals connected to said a-c ballast input terminals;

said control circuit including circuit means for modifying the a-c wave shape of the voltage applied to said a-c ballast input terminals, whereby the current through said circuit means has at least one non-conductive region; said at least one non-conductive region disposed in each of the half waves of said a-c wave shape; said at least one region located between but not including adjacent zero magnitude crossovers of the voltage applied to said control circuit input a-c terminals; and

adjustment means for varying the duration of said non-conductive region and the ratio of non-conductive time to conductive time during any half-cycle in order to control the intensity of the illumination output of said gas discharge lamp.

4,350,936

CASCADED FIN WINDING MACHINE CONTROL AND METHOD

Dale E. Jackson, Clay, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 26, 1981, Ser. No. 247,965
Int. Cl.³ B65H *59/38*
U.S. Cl. 318—7 **12 Claims**

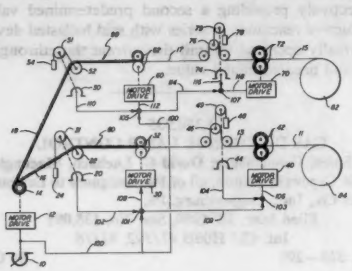
1. A method of controlling the tension in a fin strip which is slit by a pair of slitter wheels driven by a slitter motor, which is formed by a pair of forming wheels driven by a forming motor and which is wrapped about a tube rotated via a wrap-

ping motor and wherein each motor has a motor drive for regulating the speed of the motor which comprises the steps of:

setting a speed control to generate a master signal for controlling the operation of the wrapping motor;

generating a first signal in response to a condition of the fin strip between the tube and the forming wheels;

combining the master signal and the first signal to serve as an



input signal to the forming motor motor drive for regulating the speed of the forming motor;

generating a second signal in response to a condition of the fin strip between the forming wheels and the slitter wheels; and

combining the master signal, the first signal and the second signal to serve as an input signal to the slitter motor motor drive for regulating the speed of the slitter motor.

4,350,937

MOTOR SPEED CONTROL DEVICE FOR DC MOTOR

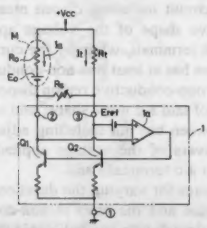
Kiyoshi Miyazaki, Komagane; Tsuneto Takeuchi; Jinichi Ito, both of Ina, and Hiroo Ashibe, Nagano, all of Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Aug. 1, 1980, Ser. No. 174,429

Claims priority, application Japan, Aug. 4, 1979, 54/99620; Aug. 31, 1979, 54/120224[U]; Sep. 4, 1979, 54/122205[U]; Sep. 6, 1979, 54/123169[U]; Nov. 7, 1979, 54/154468[U]; Nov. 12, 1979, 54/156744[U]

Int. Cl.³ H02P *5/16*

U.S. Cl. 318—331 **12 Claims**



1. A speed control device for a DC motor comprising: a power supply having first and second power terminals, one terminal of said motor being coupled to said first power terminal; a first resistor having a first terminal coupled to said first power terminal; a voltage divider circuit coupled between a second terminal of said first resistor and a second terminal of said motor; and a motor control circuit having first, second, third and fourth control terminals, said fourth control terminal being coupled to said second power terminal which is a ground terminal, said second control terminal being connected to a voltage dividing point of said voltage divider circuit, said motor control circuit further including a reference voltage source, an error detecting circuit having first and second input terminals, said first input terminal being coupled through said reference voltage source to said first control terminal and said second input terminal being coupled to said second control terminal, drive transistor means coupled between said third control terminal and said fourth control terminal, and shunt transistor means coupled between said first control terminal and said fourth control terminal, said drive transistor means and said shunt transistor means being coupled to be driven by an output of said error detecting circuit wherein a current proportional to a load current flowing through said motor to said third control terminal flows to said first control terminal and a voltage proportional to a voltage between said first and third terminals is applied to said second control terminal the control being performed so that the voltage at said second control terminal becomes equal to the reference voltage.

4,350,938

TRAVEL LIMIT STOP DEVICE FOR A MOTOR-REDUCING UNIT INTENDED IN PARTICULAR FOR A WINDOW WIPER

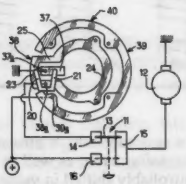
Auguste Ecole, Paris, France, assignor to Equipements Automobiles Marchal, Issy-les-Moulineaux, France

PCT No. PCT/FR80/00002, § 371 Date Sep. 4, 1981, § 102(e) Date Apr. 1, 1981, PCT Pub. No. WO81/01985, PCT Pub. Date Jul. 23, 1981

PCT Filed Jan. 4, 1980, Ser. No. 253,852

Int. Cl.³ H02P *1/04*

U.S. Cl. 318—443 **12 Claims**



1. In a travel limit stop device for a drive mechanism, especially for a motor vehicle window wiper, said mechanism comprising an electric motor which drives an output wheel housed in a casing which is closed by a cover disposed facing said wheel, the travel limit stop device comprising two sliding contacts capable of being moved relative to a circular connector, the co-operation of the sliding contacts and the connector providing either for an electrical supply source to the motor or for short-circuiting of the armature member of the motor to cause the motor to come to an abrupt halt, the improvement whereby the sliding contacts are carried by the output wheel and are electrically connected to each other and the connector is fixed on the cover of the casing and comprises three conductor sectors which are electrically insulated from each other, the three sectors defining two concentric circular tracks over each of which a sliding contact can be moved, a first conductor sector for connection to a first terminal of the supply source for the motor being in the form of an open ring, a second conductor sector for connection to the armature member of the motor being in the form of a closed ring which is disposed concentrically with respect to said open ring and a third conductor sector being for connection to a second terminal of the motor supply source.

4,350,939

SPINDLE ORIENT DEVICE

Celestino Rodriguez, Westland, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 3, 1980, Ser. No. 193,674

Int. Cl.³ G05B *11/18*

U.S. Cl. 318—592 **10 Claims**

1. A reorientation system for a machine tool having a normal and an orientation mode of operation, comprising:

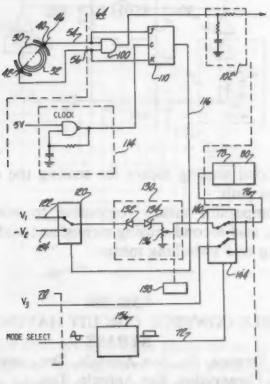
spindle means, including a spindle for rotating relative to a

stationary portion of the machine tool in response to electrical signals input thereto, said spindle means including a first reference indicator located on said spindle and situated perpendicular to the axis of rotation of said spindle, and a stationary second reference indicator located upon said stationary portion wherein when said first reference indicator is colinear with said second reference indicator, when said spindle has achieved a reoriented or reference position;

signal generating means comprising:

a half-pound magnet attached to said spindle and mounted relative to the first reference indicator such that the ends of said half-round magnet are aligned to the first reference indicator;

a pair of opposingly mounted magnetic switches magnetically coupled to said magnet and mounted to said stationary portion and aligned relative to the second reference indicator for generating a first signal when said



first magnetic switch is activated by said magnet, and a second signal when said second magnetic switch is activated by said magnet;

gating means, responsive to said first and second signals for generating an orient signal wherein said orient signal has a first level during a first interval of time corresponding to the presence of said first signal, a second level during a second interval of time corresponding to the presence of said second signal and oscillates between said first and said second levels during a third interval of time corresponding to the simultaneous occurrence of said first and said second signals;

controller means for supplying to said spindle means driving signals during the normal mode of operation to cause said spindle means to rotate at a predetermined speed in a predetermined direction and for supplying to said spindle means during the orientation mode said orient signals to cause said spindle means to be aligned to the reference orientation.

4,350,940

SYSTEM FOR SERVOCONTROLLING A SEPARATELY EXCITED DC MOTOR

Jean Dupont, La Haye les Roses, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

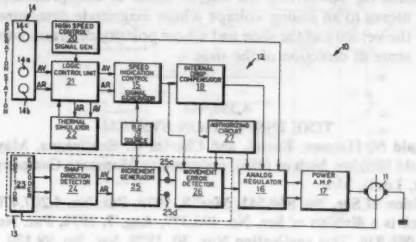
Filed Oct. 3, 1978, Ser. No. 948,298

Claims priority, application France, Oct. 5, 1977, 77 29996

Int. Cl.[3] G05B *1/02, 1/03*

U.S. Cl. 318—603 **25 Claims**

1. A servocontrol system for a separately excited DC motor comprising an analog servocontrol chain including; a feed forward generator for deriving a control signal for the speed required from the motor, an analog regulator responsive to the speed control signal for deriving a control signal for the motor, and a power amplifier responsive to the motor control signal for adjusting the speed of the motor; a chain for continuously digitally correcting errors between the motor actual position and the desired position including: encoding means coupled to the motor for deriving a first pulsed signal representing the actual motor position, and means for comparing the actual



position signal with a desired position signal derived from the required speed signal to derive an error signal to be supplied to the analog regulator, the comparison means including an integrating means having an input terminal connected to one of the output terminals of the increment generator, and to an output terminal of the control signal generator in the analog servocontrol chain.

4,350,941

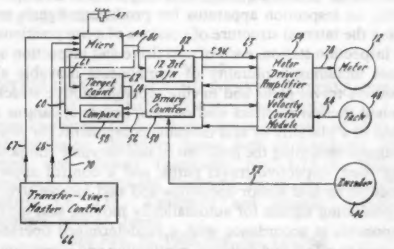
CONTROL FOR AUTOMATIC MACHINE TOOL DRIVE

George W. McClure, Saline, and Veljko Milenkovic, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 19, 1980, Ser. No. 188,449

Int. Cl.[3] G05B *19/28*

U.S. Cl. 318—603 **6 Claims**



1. In a drive system wherein a variable speed electric motor produces cyclical movement of a slide along a path, a control system adapted for connection to the motor power supply comprising:

encoder means producing a constant number of electrical pulses during each revolution of the motor shaft;

means for determining a reference position for the slide and for initializing the control system;

a memory wherein predetermined paired values of slide velocity and position representing ideal such values for the slide at multiple incremental target positions along its path are stored;

data processing means comprising a binary counter for counting and registering encoder pulses following initialization, the count representing the actual position of the slide with respect to the reference position a microprocessor adapted to recall from said memory the slide velocity-position pair that corresponds to a slide target position and adapted to produce a digital signal representing the slide

velocity corresponding to the slide target position; and a comparator receiving input signals representing a slide target position and the actual slide position, producing an output signal when said input signals are identical, whereby the signal representing the slide velocity corresponding to the slide target position is produced by the microprocessor if the output signal is received from said comparator; and

means for converting the output signal of said processing means to an analog voltage whose magnitude determines the velocity of the slide and whose polarity determines the sense of direction of the slide.

4,350,942

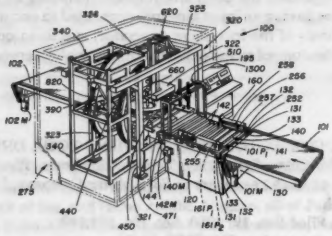
TIRE INSPECTION SYSTEM

Donald N. Heisner, Euclid, and Charles R. Bentivegna, Mayfield Heights, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 884,541, Mar. 8, 1978, Pat. No. 4,207,470, which is a division of Ser. No. 495,377, Aug. 7, 1974, Pat. No. 4,088,936. This application Nov. 30, 1979, Ser. No. 99,150

Int. Cl.³ G05G *5/00*

U.S. Cl. 318—626 **8 Claims**



1. In a tire inspection apparatus of the type having drive apparatus for delivering and positioning a tire at an inspection station, an inspection apparatus for producing signals representing the internal structure of portions of a tire positioned at said inspection station, each of said drive and inspection apparatuses including a plurality of components movable along respective travel paths and having separate motive structures attached thereto to effect said motion, sensor apparatus connected to a plurality of said movable components for producing signals indicating the positions of said movable components along their respective travel paths, and a control apparatus connected to said sensor apparatus and said motive structure for generating signals for automatically moving said movable components in accordance with a predetermined operational sequence to effect said delivery, positioning and inspection, the improvement of an interrupt system, comprising:

(a) circuitry for enabling manual control of movements of said components of said tire inspection apparatus;

(b) interrupt circuitry connected to said control apparatus for terminating said automatic movement and actuating said manual control enabling circuitry for enabling manual control of said movable components.

4,350,943

AMPLIFIER FOR INDUCTIVE LOADS WITH CORRECTIVE CURRENT SENSING

Eric K. Pritchard, 1702 Plymouth Ct., Bowie, Md. 20716

Filed Apr. 4, 1980, Ser. No. 137,301

Int. Cl.³ G05B *19/40*

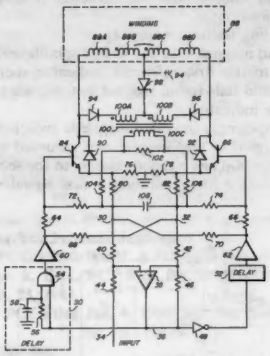
U.S. Cl. 318—696 **26 Claims**

1. A switching amplifier for inductive loads and having an input consisting of:

a. A switching means and a diode means connected across said switching means for conducting the current in said load;

b. A first sensing means for sensing the current in said switching means and said diode means;

c. A current path whose current makes the current in said first sensor differ from the current in said inductive load;



d. A second sensing means for sensing the current in said current path;

e. A comparator means responsive to said first sensing means, said second sensing means, and said input for controlling said switching means.

4,350,944

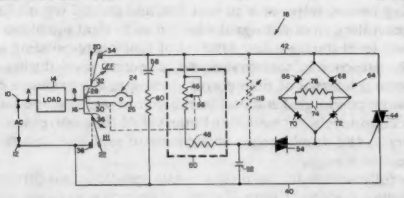
VARIABLE CONTROL CIRCUIT HAVING A TIMED BYPASS

George E. Strauch, Jr., San Antonio, Tex., assignor to Power Controls Corporation, San Antonio, Tex.

Filed Oct. 24, 1980, Ser. No. 200,377

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—779 **5 Claims**



1. A variable speed control system for fans having spring loaded mechanical louvers comprising:

AC voltage source;

fan blades mounted adjacent to said spring loaded mechanical louvers;

a spring connected to said mechanical louvers for urging said mechanical louver to an open position but having insufficient strength to hold said mechanical louvers in an open position;

AC motor connected to said fan blades for turning said fan blades upon turning said motor by said AC voltage source;

control circuit located between a first side of said AC voltage source and said AC motor, a second side of said AC voltage source being connected to said AC motor, said control circuit further comprising:

single armature means actuated by an uppermost and a lowermost movement of a toggle lever for a positive ON and a positive OFF, respectively, through contacts on said single armature means;

switching means connected between one of said contacts of said single armature and said AC voltage source, said switch means having a gate;

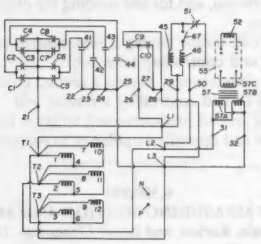
first variable resistance means and first capacitor means in series across said switching means and having gating means connected therebetween to said gate;

bridge means connected between one side of said switching means to said gate to shunt said gating means for a predetermined time interval, said bridge means having an RC network thereacross to set said predetermined time interval of sufficient duration to bring said fan blades to near full speed to open said louvers before slowing said AC motor for intermediate positions of said toggle lever by eliminating said shunt.

4,350,945
PHASE CONVERTER CONTROLLED BY D-C POWER

Horace B. Ford, 715 Nassau Bay II, Granbury, Tex. 76048

Filed Feb. 9, 1981, Ser. No. 232,694
Int. Cl.³ H02P 1/44
U.S. Cl. 318—795 **3 Claims**



1. A system for converting a three phase motor to one phase operation, the motor having three phase windings with two windings being adapted to be coupled to single phase A-C power, said system comprising:

a first pair of terminals adapted to be coupled to a pair of windings of the motor,

starting capacitor means coupled to said first pair of terminals by way of normally open contact means,

a second pair of terminals adapted to be coupled to said pair of windings of the motor,

running capacitor means coupled to said second pair of terminals,

a third pair of terminals having normally closed relay contacts and electrical coil means coupled thereto,

said electrical coil means closing said contact means when said electrical coil means is energized,

a fourth pair of terminals having the primary of a transformer coupled thereto,

said fourth pair of terminals having one terminal adapted to be coupled to the windings of the motor for applying A-C power from the motor to said primary of said transformer,

rectifier means coupled to the secondary of said transformer for converting A-C power to D-C power,

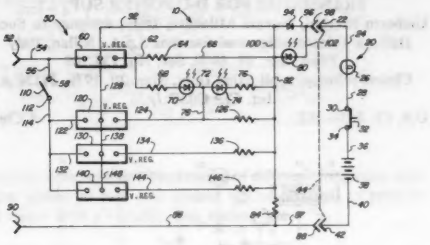
a relay coil coupled to the output of said rectifier means for opening said relay contacts when a predetermined level of D-C voltage is applied to said relay coil,

said third pair of terminals being adapted to be coupled to A-C power for energizing said electrical coil means for closing said contact means such that when single phase A-C power is applied to said pair of windings of the motor, said starting capacitor means applies a starting phase shift to the windings of the motor until the D-C voltage applied to said relay coil builds up to said predetermined level, at which time said relay coil opens said relay contacts, de-energizing said electrical coil means and disconnecting said starting capacitor means from said windings of the motor.

4,350,946
MULTIPLE CONSTANT CURRENT BATTERY CHARGING APPARATUS

Onno M. Prinsze, 4528 N. Pima Rd., Scottsdale, Ariz. 85261

Filed Dec. 17, 1979, Ser. No. 104,311
Int. Cl.³ H02J 7/04
U.S. Cl. 320—22 **6 Claims**



1. Multiple constant current charging apparatus for charging a rechargeable battery, comprising, in combination:

voltage means for providing a direct current voltage source;

first constant current means connected to the voltage means for providing a first substantially constant charging current, including a first voltage regulator for providing a substantially constant voltage from the voltage means and a first resistor in series with the first voltage regulator for providing the first substantially constant charging current;

second constant current means for providing a second substantially constant charging current;

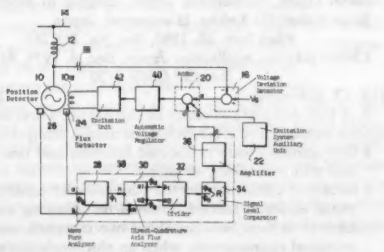
conductor means for connecting the first constant current means and the second constant current means to a battery for charging; and

switch means comprising a single switch for selectively connecting and disconnecting as desired the voltage means to the second constant current means for providing either the first substantially constant current for charging the battery or the first and second substantially constant currents for charging the battery.

4,350,947
SYSTEM FOR PREDICTING DESYNCHRONIZATION OF A SYNCHRONOUS MACHINE

Chikasa Uenosono; Takao Okada; Junya Matsuki, all of Kyoto; Tadashi Naito; Shinichiro Inoue, both of Kawasaki, all of Japan, and Masaki Takahashi, No. 1-13-18, Higashi-Toyonaka, Toyonaka-shi, Osaka-fu, Japan, assignors to Fuji Electric Co. Ltd., Kanagawa and Masaki Takahashi, Toyonala, both of, Japan

Filed Feb. 25, 1980, Ser. No. 123,964
Int. Cl.³ H02P 9/14; G01R 33/02
U.S. Cl. 322—17 **8 Claims**



1. A method for predicting desynchronization of a synchronous machine, comprising the steps of detecting at least one of

(a) the functional values of the direct axis flux and (b) the quadrature axis flux in the gap of the synchronous machine, and determining the variance of said values from predetermined levels.

4,350,948

VOLTAGE-STEP-DOWN CIRCUIT WITH CHOPPING TRANSISTOR FOR D-C POWER SUPPLY

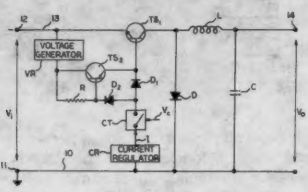
Umberto Meroni, Novate Milanese, Italy, assignor to Societa Italiana Telecomunicazioni Stemens S.p.A., Milan, Italy

Filed Mar. 19, 1980, Ser. No. 131,705

Claims priority, application Italy, Mar. 20, 1979, 21130 A/79

Int. Cl.³ G05F *1/56*

U.S. Cl. 323—282 **4 Claims**



1. A step-down circuit for deriving a reduced output voltage from the voltage of a d-c supply connected across a pair of conductors, comprising:

a chopping transistor connected in series with one of said conductors between an input end and an output end thereof, said transistor being provided with a control electrode;

voltage-smoothing filter means including a shunt capacitance connected across said conductors downstream of said transistor;

a control loop including in series an electronic switch, a first resistor and an ancillary source of d-c voltage substantially lower than the supply voltage, said first resistor being part of a voltage divider also including a second resistor, said first resistor being inserted between said control electrode and the other of said conductors while being galvanically separated from said control electrode by said second resistor and by a coupling capacitor interposed between said voltage divider and said control electrode, said second resistor lying outside said loop; and

pulse-generating means connected to said electronic switch for alternately opening and closing same in a predetermined rhythm whereby said series resistor is traversed by a pulsating current rendering said resistor intermittently conductive.

4,350,949

BIDIRECTIONAL SWITCHING CIRCUIT WITH CONTROL TERMINAL

Shinichi Fujita, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 25, 1980, Ser. No. 210,255

Claims priority, application Japan, Dec. 4, 1979, 54-157046

Int. Cl.³ G05F *1/20*

U.S. Cl. 323—284 **13 Claims**

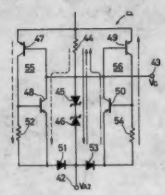
1. A bidirectional switching circuit having a first terminal, a second terminal and a controlling terminal, comprising:

a first resistor means connected between said first terminal and said controlling terminal;

a threshold circuit connected between said controlling terminal and said second terminal for allowing an electric current to flow between these two terminals with a bidirectional characteristic when an absolute value of a voltage applied across said controlling terminal and said second terminal exceeds a predetermined level;

a first circuit means connected between said first terminal and said second terminal for establishing conduction between said first terminal toward said second terminal when a voltage exceeding a first predetermined voltage is applied between the first terminal and controlling terminal, and for self-holding the condition of said conduction;

a second circuit means connected between said first terminal and said second terminal for establishing conduction between said second terminal and said first terminal in a direction from said second terminal toward said first terminal when a voltage exceeding a second predetermined



voltage is applied between the first terminal and the controlling terminal, and for self-holding the condition of said conduction;

said first circuit means having a first control terminal connected to said controlling terminal;

said second circuit means having a second control terminal connected to said controlling terminal; and

said first and second predetermined voltages being equal in magnitude and opposite in polarity to each other.

4,350,950

FREQUENCY MEASURING METHOD AND APPARATUS

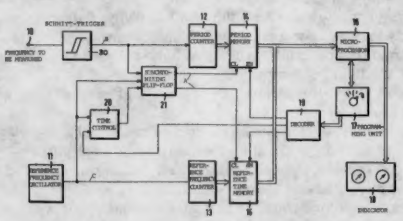
Dieter Waldmann, Karben, and Bernd Ohnesorge, Maintal, both of Fed. Rep. of Germany, assignors to Nord-Micro Elektronik Feinmechanik AG, Frankfurt, Fed. Rep. of Germany

Filed May 27, 1980, Ser. No. 153,569

Claims priority, application Fed. Rep. of Germany, May 30, 1979, 2921899

Int. Cl.³ G01R *23/02*

U.S. Cl. 324—78 D **8 Claims**



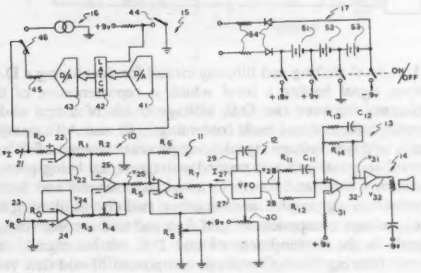
1. A circuit arrangement for measuring a frequency, comprising continuously running period counter means (12) having a counting input for receiving a signal having said measuring frequency, and a period counter output for providing counted periods of said measuring frequency, period memory means (14) operatively connected to said period counter output for storing a number of periods counted by said period counter means (12), reference frequency generating means (11), continuously running time counter means (13) operatively connected to said reference frequency generating means (11) for providing time duration measurements, time memory means (15) operatively connected to said time counter means (13) for storing said time duration measurements of said time counter means (13), synchronizing means (21) connected to said period and time memory means for controlling the transfer of counts from said period and time counter means (12, 13) into the respective period and time memory means (14, 15), and control

means (17, 19, 20) operatively connected to said synchronizing means (21) and to said period and time memory means for determining the operation of said period and time memory means, and computer means (16) operatively connected to said period and time memory means (14, 15) and to said control means for calculating the quotient of the number of periods counted by said period counter means and the time duration measurements from said time counter means, whereby the difference between two successively stored counts in the period memory means (14) provides the numerator and whereby the difference between two successively stored counts in the time memory means (15) provides the denominator of said quotient.

4,350,951
AUDIO ANALOG VOLTMETER

William J. Jasper, Escondido, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 26, 1979, Ser. No. 106,473
Int. Cl.[3] G01R 19/00, 19/165
U.S. Cl. 324—133 8 Claims



1. An electrical instrument for measuring any input voltage level through the sense of hearing, said instrument being comprised of:

means for amplifying said input voltage with a manually selectable gain to form a first signal that is an analog of said input voltage and determines the range over which said input voltage is measured;

means for generating a second signal having a component proportional to said first signal and having another component of a manually selectable constant magnitude that determines the audible tone corresponding to any single voltage in said range, said generating means including means for manually selecting said constant magnitude;

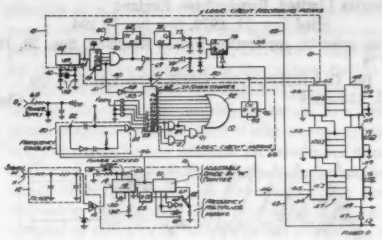
means for converting said second signal into an audible tone with a frequency that is the analog of the magnitude of said second signal.

4,350,952
DIGITAL READ-OUT METER CIRCUIT AND TACHOMETER WITH VARIABLE METER UPDATE RATE USING AN UP/DOWN COUNTER MEANS

James L. Holt, Bristol, Wis., and Robert P. Otka, Gurnee, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 5, 1979, Ser. No. 90,984
Int. Cl.[3] G01P 3/48, 3/54; G01R 23/02; G06G 7/00
U.S. Cl. 324—166 24 Claims

1. A digital read-out meter circuit having a variable meter data update rate, said circuit comprising a digital read-out meter having counters with an input for receiving signal pulses having a frequency representative of a parameter value to be displayed by said meter, and having a counter reset terminal and a data update strobe terminal, up/down counter means having an input for receiving a series of pulses having a frequency representative of the parameter value to be displayed, and operative for providing an output representative of the rate of change of the parameter value to be displayed, and logic circuit means subject to said up/down counter means output

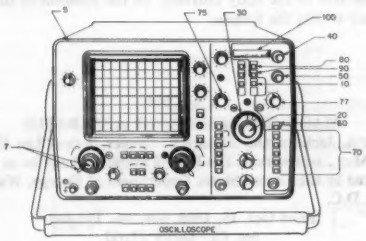


for controlling selective application of different frequency data update pulses to said data update strobe terminal to provide said meter with a variable data update rate.

4,350,953
TIME INTERVAL MEASUREMENT APPARATUS

Allan I. Best; Thomas K. Bohley, and Ronald C. Westlund, all of Colorado Springs, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 20, 1978, Ser. No. 888,094
Int. Cl.[3] G04F 8/00
U.S. Cl. 324—183 9 Claims



1. Electronic circuit apparatus comprising:

trigger means for providing first, second and third trigger signals;

main generator means coupled to said trigger means for producing a time varying sweep signal in response to the first trigger signal;

deflection means for providing a deflection signal;

display means coupled to said deflection means and to said main generator means for generating a display in response to the sweep signal and the deflection signal;

clock means for generating periodic clock signals;

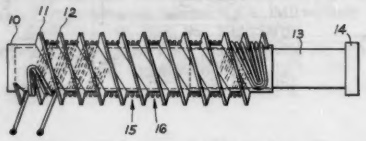
processing means coupled to said clock means and to said trigger means for determining a difference count representing the difference between the number of periodic clock signals occurring during a time interval between occurrences of the first and second trigger signals and the number of periodic clock signals occurring during a time interval between occurrences of the first and third trigger signals; and

digital display means coupled to said processing means for providing a digital display responsive to the difference count.

4,350,954
INDUCTIVE TYPE DISPLACEMENT TRANSDUCERS

Alec H. Seilly, North Wembley, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Sep. 12, 1979, Ser. No. 75,194
Claims priority, application United Kingdom, Sep. 28, 1978, 38586/78
Int. Cl.[3] H01F 21/06; G01B 7/14; G01R 33/00
U.S. Cl. 324—208 4 Claims

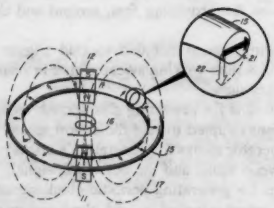


1. A displacement transducer comprising a former of non-magnetic and non-conductive material, winding means carried on said former, a core member slidable within said former, said core member in use being connected to or forming part of a member the displacement of which is to be measured, said core member being formed from electrically conductive non-magnetisable material and said winding means comprising first and second interengaged helical windings each having at least three conductors with the conductors in side by side relationship and interconnected such that the current flow in one winding is opposite to that in the other winding, said windings in use forming the frequency control component of an oscillator and having alternating current flowing therein, said alternating current including eddy currents in the portion of the core member which lies within the former, the inductance of the winding means and frequency of the oscillator being dependent due to the eddy currents, on the position of the core member within the former.

4,350,955
MAGNETIC RESONANCE APPARATUS

Jasper A. Jackson, and Richard K. Cooper, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 10, 1980, Ser. No. 195,968
Int. Cl.[3] G01N 27/00
U.S. Cl. 324—303 13 Claims

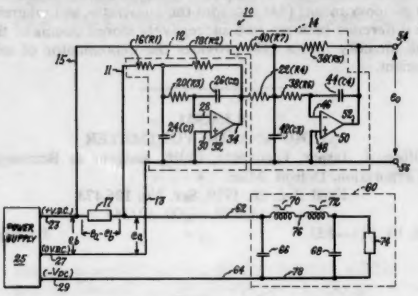


1. Nuclear magnetic resonance equipment comprising:
means for producing a toroidal region of homgeneous radial magnetic field;
transmitting means for transmitting a radio frequency pulse into said toroidal region of homogeneous radial magnetic field to excite nuclei therein, and
receiving means for receiving nuclear magnetic resonance signals from said nuclei in said toroidal region of homogeneous radial magnetic field.

4,350,956
LEVEL SHIFTING AND FILTERING CIRCUIT

Robert P. DePuy, Cherry Hill, N.J., assignor to General Electric Company, Philadelphia, Pa.

Filed Oct. 20, 1980, Ser. No. 198,891
Int. Cl.[3] H03K 13/32; H03F 3/45
U.S. Cl. 328—167 5 Claims



1. A level shifting and filtering circuit for developing a D.C. output signal having a level which is representative of the difference between the D.C. voltage levels of a first and a second voltage signal each containing D.C. and A.C. components, said first voltage signal being present between a first and second terminal and said second voltage signal being present between a third and fourth terminal, said second and fourth terminals being coupled to each other, said circuit filtering the A.C. voltage component of said first and said second voltage signals in the development of said D.C. output signal, said circuit filtering the A.C. voltage component of said first voltage signal being performed to an extent which is substantially greater than the filtering being performed on said second voltage signal, said circuit comprising:
a first network having a first plurality of resistive and capacitive elements and further having a first differential means having a first and a second input for developing an output signal representative of the voltage difference applied between said first and said second inputs, said first input being coupled to said first terminal by a first portion of said first plurality of resistive and capacitive elements, said second input being coupled to said second terminal, said output signal of said first differential means being fedback to said first input by a second portion of said first plurality of resistive and capacitive elements, said first plurality of resistive and capacitive elements having preselected values that determine the closed-loop response of said first network and reduce the A.C. voltage component existing in said output signal of said first differential means by a predetermined amount,
a second network having a second plurality of resistive and capacitive elements and further having a second differential means having a first and a second input for developing an output signal representative of the voltage difference applied between said first and said second inputs, said first input being coupled to said third terminal by a first portion of said second plurality of resistive and capacitive elements, said first input also being coupled to said output signal of said first differential means by a second portion of said second plurality of resistive and capacitive elements, said second input being coupled to said fourth terminal, said output signal of said second differential means being fed-back to said first input by a third portion of said second plurality of resistive and capacitive elements, said second plurality of resistive and capacitive elements having preselected values that determine the closed-loop response of said second network and reduce the A.C. voltage component existing in said output signal of said second differential means by a

predetermined amount, said output D.C. signal of said second differential means being representative of the voltage difference between the D.C. voltage levels of said first and said second voltage signals.

4,350,957

PULSE COUNTER-TYPE FM DETECTOR

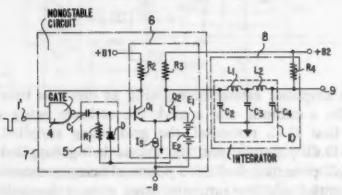
Yukihiko Miyamoto, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1980, Ser. No. 140,821

Claims priority, application Japan, Apr. 20, 1979, 54-53969[U]

Int. Cl.³ H03D *3/04;* H03K *3/284;* H04B *1/16*

U.S. Cl. 329—107 6 Claims



1. In a pulse counter-type FM detector circuit for obtaining audio signals at an output terminal by detecting FM signals in the following order through a limiter circuit, a trigger pulse generating circuit, a monostable circuit and an integrator connected to the output terminal where the monostable circuit comprises a gate circuit having at least two inputs where trigger pulses from said trigger pulse generating circuit are applied to a first one of the two inputs and a feedback signal to the other input, a differentiating circuit responsive to the output from the gate circuit, a differential inverter having a power supply and where said integrator includes an LC type low pass filter connected to the output side of said differential inverter circuit, the improvement comprising

a terminal resistor connected between the power supply and the output terminal so that a part of the current flowing in the said differential inverter circuit is diverted through said terminal resistor.

4,350,958

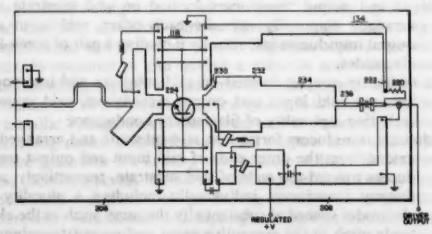
IMPEDANCE MATCHING CIRCUITRY FOR RADIO FREQUENCY SIGNAL POWER AMPLIFIERS

Antonio Pagnamenta, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 17, 1980, Ser. No. 112,765

Int. Cl.³ H03F *3/04*

U.S. Cl. 330—286 6 Claims



1. Impedance matching circuitry for radio frequency (RF) signal amplifying means having an input and an output, comprising:

substrate means having first and second surfaces for receiving plated circuitry thereon, said second surface of the substrate means being plated with a conductive substance for providing a ground plane; and

a plurality of microstrip transmission line means being disposed on the first surface of the substrate means and coupled in series with one another, said series coupled plurality of microstrip transmission line means further being coupled to the output of said amplifying means for matching the output of said amplifying means to a predetermined output impedance, each of said microstrip transmission line means having different predetermined characteristic impedances whose magnitudes are less than the magnitude of the predetermined output impedance, and each microstrip transmission line means being successively coupled in series to the output of said amplifying means, having a length that is less than one-fourth wavelength of the RF signal and having a greater predetermined characteristic impedance and a longer length than the previously coupled microstrip transmission line means.

4,350,959

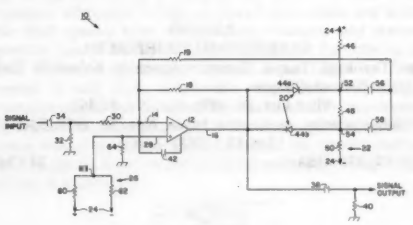
FEEDBACK SIGNAL AMPLIFIER

Erik Rosenbaum, Woodbine, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 14, 1980, Ser. No. 140,034

Int. Cl.³ H03F *1/34*

U.S. Cl. 330—110 7 Claims



1. A circuit comprising:

a power supply;

an operational amplifier having first and second inputs and an output,

a signal coupling circuit connected to said first input of said operational amplifier;

a first feedback resistor connected to said first input and to the output of said operational amplifier,

a second feedback resistor connected to said first input of said operational amplifier and connected to said output via a pair of capacitors and a pair of diode switches, the diodes being in circuit in opposite polarity and each diode being connected in series with one of said capacitors;

a first bias network connecting said power supply with said pair of diodes to determine the operation potential of each diode; and

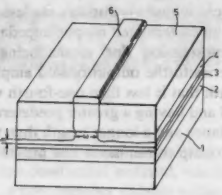
a second bias network connected between said power supply and said second input, whereby the gain of said operational amplifier is varied between two values as determined by said first and second feedback resistors and is unaffected by variations in the output of said power supply.

4,350,960

SELF SATURATING SEMICONDUCTOR LASERS

Michael R. Matthews; David H. Newman; David R. Smith, and Alan G. Steventon, all of Woodbridge, England, assignors to The Post Office, London, England

Continuation of Ser. No. 918,563, Jun. 23, 1978, abandoned.
This application Jul. 14, 1980, Ser. No. 168,107
Claims priority, application United Kingdom, Jul. 1, 1977, 27666/77
Int. Cl.³ H01S 3/19
U.S. Cl. 372—46 11 Claims



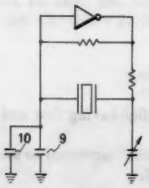
1. In an optical communications system including at least a laser and an optical fiber coupled to said laser, the improvement including: said laser having means for providing a substantially constant incremental efficiency in a predetermined operating range above its lasing threshold and a decreasing incremental efficiency when operated above said predetermined range so that the lasing flux has self saturating properties.

4,350,961

ELECTRONIC TIMEPIECE

Ryo Toyokuni, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Oct. 30, 1979, Ser. No. 89,462
Claims priority, application Japan, Nov. 10, 1978, 53-138564
Int. Cl.³ H03F 1/30
U.S. Cl. 331—158 14 Claims



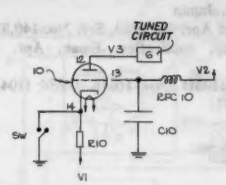
1. An oscillator circuit comprising: an X-cut quartz crystal resonator having a negative secondary temperature coefficient; an amplifer for driving said crystal resonator to oscillate; and a plurality of temperature compensating capacitors connected for compensating for temperature variations, said plurality of temperature compensating capacitors each comprising a ferroelectric material and each of said temperature compensating capacitors having different respective Curie Point temperatures, and the respective peak capacitance values of each of said temperature compensating capacitors and the Curie Point temperatures being selected to achieve a frequency-temperature characeristic curve of the oscillator circuit having a minimized rate of change of frequency per degree of temperature change.

4,350,962

R.F. SWITCHED AMPLIFIER AND A.M. MODULATOR

Ian L. Hill, Turramurra, Australia, assignor to T.B.C. Pty. Limited, Thornleigh, Australia

Filed Sep. 4, 1980, Ser. No. 183,875
Claims priority, application Australia, Sep. 25, 1979, PE0649
Int. Cl.³ H03C 1/16; H03F 3/24, 5/00
U.S. Cl. 332—60 10 Claims



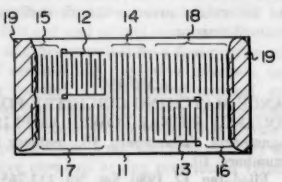
1. An amplifier circuit comprising an electron tube having an anode, a cathode and a grid; the cathode being supplied with a first D.C. potential, the grid being supplied with a second D.C. potential and the anode being supplied with a third D.C. potential; said third potential being greater than said first potential, said first potential being greater than said second potential and said grid being A.C. coupled to ground; wherein said cathode is connected via switch means to a further potential less than said second potential, said switch means being operable at a rate determined by the desired frequency of the output of said anode.

4,350,963

SURFACE ACOUSTIC WAVE DEVICE

Hisao Iwamoto, and Noboru Wakatsuki, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 24, 1980, Ser. No. 219,948
Claims priority, application Japan, Dec. 27, 1979, 54-169190
Int. Cl.³ H03H 9/145, 9/25, 9/42, 9/64
U.S. Cl. 333—151 17 Claims



1. A surface acoustic wave device comprising:
a piezoelectric substrate;
input and output transducers formed on said substrate and arranged diagonally opposite each other, said input and output transducers individually including a pair of comb-like electrodes;
a multistrip coupler formed on said substrate and interposed between said input and output transducers, said coupler including a plurality of filamentary conductors;
dummy transducers formed on said substrate and arranged to extend from the outer ends of said input and output transducers toward the ends of said substrate, respectively, said dummy transducers individually including a plurality of electrodes spaced at substantially the same pitch as the electrode pitch in the respective input and output transducers; and
dummy transducers formed on said substrate and arranged to extend from the opposite ends of said multistrip coupler toward the ends of said substrate, respectively, said dummy transducers individually including a plurality of electrodes

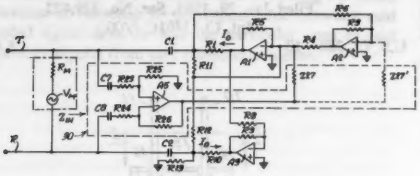
spaced at substantially the same pitch as the conductor pitch in said multistrip coupler.

4,350,964

IMPEDANCE GENERATOR CIRCUIT

Charles W. Chambers, Jr., Downers Grove, Ill., assignor to Tellabs, Inc., Lisle, Ill.

Division of Ser. No. 45,274, Jun. 4, 1979, Pat. No. 4,283,604.
This application Jun. 30, 1980, Ser. No. 164,308
Int. Cl.³ H03H *11/46*
U.S. Cl. 333—213 **16 Claims**



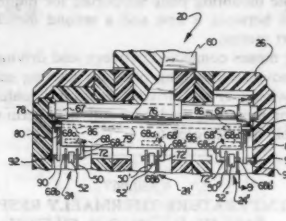
1. An impedance generator for interfacing with a two-wire transmission system, for example with the tip and ring leads of a telephone pair, for generating a controlled current flow through the system which generates a selected impedance across the wires and for providing common mode rejection to longitudinal voltages on the system, said impedance generator having first and second outputs each for connection with a separate one of the wires and comprising first and second voltage amplifier means each having an input, an output and an output impedance connected between the amplifier means output and a separate one of said impedance generator outputs, said first voltage amplifier means output being connected through its output impedance with said impedance generator first output; means for connecting said first amplifier means output with said second amplifier means input so that voltage signals at said first amplifier means input control the voltages generated at each of said amplifier means outputs; feedback means coupled between said impedance generator first output and said first amplifier means input; and circuit means coupled between said impedance generator outputs and said first amplifier means input, said feedback means and said circuit means coupling signals at said impedance generator outputs from the wires of the transmission system to said first amplifier means input, said feedback means and said circuit means in response to equal longitudinal voltages on the wires coupling to said first voltage amplifier means input signals which cancel to zero at said first voltage amplifier means input so that said first and second voltage amplifier means do not generate voltages at their outputs in response to equal longitudinal voltages on the wires, whereby said impedance generator has common mode rejection to equal longitudinal voltages on the wires, wherein said first and second amplifier means each generate zero volts or reference potential at their outputs in response to equal longitudinal voltages on the wires and substantially equal value and opposite direction current flows through their output impedances, and therefore at said impedance generator outputs, in response to and having a value in accordance with noncancelling signals at said first amplifier means input, and wherein the two-wire transmission system is of the type having a metallic voltage across the wires, said impedance generator including means connected with the outputs from said impedance generator for sensing the metallic voltage thereacross and therefore across the wires and for generating at an output therefrom a control voltage having a value in accordance therewith; and means for coupling said sensing means output with said first voltage amplifier means input for controlling operation of said first and second amplifier means to generate at said impedance generator outputs a current flow equal to that which would flow through the selected impedance if the metallic voltage were impressed across the impedance, whereby said impedance generator exhibits the selected impedance at its outputs and across the wires.

4,350,965

MULTI-POLE CIRCUIT BREAKERS

Alexander R. Norden, New York, N.Y., assignor to Federal Pacific Electric Company, Newark, N.J.

Filed Apr. 17, 1981, Ser. No. 255,154
Int. Cl.³ H01H *75/00, 77/00, 83/00*
U.S. Cl. 337—47 **13 Claims**



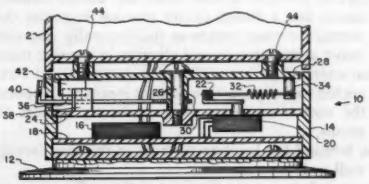
1. A multi-pole circuit breaker including in combination a pair of separable contacts in each of a plurality of adjacent poles, a common manually operable handle for all said poles, each said pair of contacts having a latching contact linkage connected to said common operable handle to engage and disengage each said pair of contacts manually, each said latching linkage including a current-responsive release means for releasing the said latching linkage upon occurrence of a predetermined current level therethrough, said latching linkage including additional release means for releasing each said pair of contacts when any one of said current-responsive release means detects the predetermined current level, each said latching linkage providing latching of said pair of contacts in engagement when said linkage is moved overcenter, and a rotatable shaft spaced from said latching linkages, said manually operable handle fixedly secured to said shaft for rotating said shaft, a pair of oppositely disposed depending arms fixedly secured to said shaft, link means journalled within aligned apertures in said pair of arms, and bar means for interconnecting the latching linkages, said bar means supported by said link means, whereby rotational motion of said bar means relative to said link means is prevented and overcenter movement of said linkage is minimized.

4,350,966

THERMOSTAT ASSEMBLY

Marvin D. Nelson, St. Louis Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 28, 1981, Ser. No. 258,333
Int. Cl.³ H01H *37/02;* F23N *5/20*
U.S. Cl. 337—302 **10 Claims**



1. An adapter for converting a conventional thermostat to a time-controlled setback thermostat, said thermostat including a tilt responsive switch which is tilted in response to temperature changes, said adapter comprising:

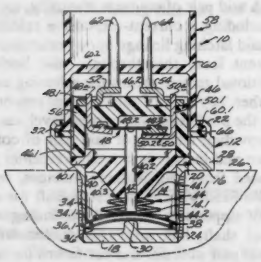
a housing body member,
means for mounting said body member on a fixed supporting structure;
a clock-controller means,
support means for supporting said clock-controller on said body member;
a driving means mounted on said support means and electrically connected to an output from said clock-controller to be actuated by said clock-controller means between a first and a second position;
a movable mounting plate supported for limited rotational motion between a first and a second direction on said support means;
coupling means connected between said driving means and said movable mounting plate for moving said mounting plate whenever said driving means is actuated; and
means for mounting said conventional thermostat on said movable mounting plate.

4,350,967

TWO-TEMPERATURE THERMALLY RESPONSIVE FAST IDLE CONTROL SWITCH

John Doherty, Jr., Assonet, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 90,210, Nov. 1, 1979. This application Dec. 15, 1980, Ser. No. 216,708
Int. Cl.³ H01H 37/54
U.S. Cl. 337—343 **7 Claims**



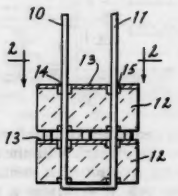
1. A thermally responsive electrical switch comprising
a thermally conducting housing having a well with an open end and a closed end and having flange means around the open well end,
thermally responsive means disposed in the well in heat-transfer relation to the housing to move in the well in response to changes in housing temperature, and
switch means having first and complementary contact means thereon positioned in the open well so that the first contact means are engaged at one side of the switch means by the thermally responsive means to be moved between an open circuit position spaced from the complementary contact means and a closed circuit position engaging the complementary contact means as the thermally responsive means move in response to said changes in housing temperature
characterized in that resilient conductors are electrically connected to the respective contact means at an opposite side of the switch means to bear resiliently against the switch means,
the housing has locating surfaces in the well facing the open well end,
the switch means are disposed in the well resting against said locating surfaces to be positioned in a selected location in the well to assure reliable movement of the first contact means in response to movement of the thermally responsive means when selected changes in housing temperature occur, and
a terminal member having an insulating body with flange means and having a pair of rigid conductive terminals is mounted on the body, the housing flange means being folded over the terminal member flange means securing the member to the housing with the rigid terminals bearing against the resilient conductors for electrically connecting the terminals to the respective contact means and for resiliently holding the switch means in said selected location in the housing well.

4,350,968

LIQUID LEVEL DETECTOR

Richard D. Tokarz, West Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 29, 1981, Ser. No. 229,422
Int. Cl.³ H01C 7/00
U.S. Cl. 338—13 **5 Claims**



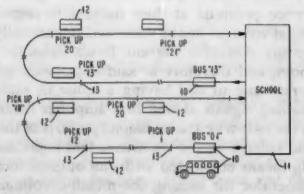
1. A liquid level detector, comprising:
a first upright electrical conductor;
a second upright electrical conductor;
electrical insulating means fixedly spacing the first and second conductors relative to one another across a first resistance path of relatively high electrical resistance;
and electrically conductive means between the first and second conductors at a discrete location along their respective lengths for creating an interruptible second resistance path between them which includes a liquid accessible gap between said electrically conductive means and at least one of said conductors; the gap width being such that the electrical resistance across the second resistance path when the gap is filled with liquid is detectably less than when the gap is emptied.

4,350,969

VEHICLE IDENTIFICATION AND POSITION SIGNALLING SYSTEM IN A PUBLIC TRANSPORTATION SYSTEM

William H. Greer, Daheim Rd., Millbrook, N.Y. 12545

Filed Mar. 31, 1980, Ser. No. 135,470
Int. Cl.³ G08G 1/12; G08C 21/00
U.S. Cl. 340—23 **7 Claims**



1. A system for notifying prospective passengers of a transportation system of the approach of a particular vehicle, at a predetermined pickup point, comprising:
transmitter means mounted in each of the vehicles for transmitting selectably different detectable signals, including operator control switch means, selectively actuated by an operator to cause transmission of said detectable signals, one of said detectable signals including a particular vehi-

cle identification code, and another of said detectable signals including a changing sequence of vehicle position codes;

receiver means, remote from any pickup point and in the possession of a prospective passenger, having a plurality of signal detectors including switch means, manipulated by a passenger, to select a signal detector responsive to a selected one of said detectable signals providing a particular vehicle identification code and a particular vehicle position code; and

indicator means associated with said receiver means, and connected to said signal detectors, for providing a position indication in response to correspondence between said selected signal detector and the particular ones of said detectable signals from said transmitter means.

4,350,970

METHOD FOR TRAFFIC DETERMINATION IN A ROUTING AND INFORMATION SYSTEM FOR INDIVIDUAL MOTOR VEHICLE TRAFFIC

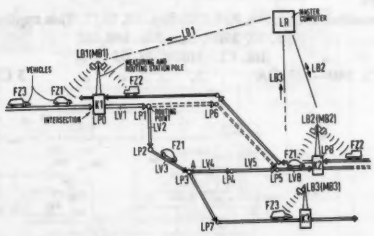
Romuald von Tomkewitsch, Ebenhausen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 29, 1980, Ser. No. 201,697

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1979, 2945852

Int. Cl.³ G08G *1/09*

U.S. Cl. 340—23 **9 Claims**



1. In a method for traffic management in a routing and information system for motor vehicle traffic having a network of stationary routing stations each located in the vicinity of a roadway, in which the routing stations transmit route information and local information concerning their positions to passing vehicles, and in which a trip destination is input into a device onboard a vehicle and transmitted therefrom to a routing station for evaluation so that specific route recommendations may be selected, the improvement therein comprising:

transmitting, from a first routing station to a passing vehicle, a message including suggested route data constituting a vector chain, the address of the first routing station and a start command;

receiving the message from the routing station in the device onboard the vehicle, storing the route data in the onboard device, and activating a travel time measuring device in the vehicle with the received start command; and

transmitting, after traveling to a second routing station along the path suggested by the route data, the address of the first routing station, the route data, and the elapsed travel time to the second routing station.

4,350,971

CIRCUIT FOR USE IN THE DETECTION OF THE CONDITION OF AN ISOLATED SWITCH CONTACT

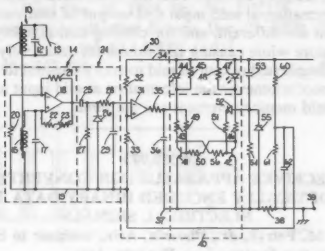
John S. Forrester; David F. Swindell, both of West Midlands, and Michael A. Wildsmith, Birmingham, all of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Aug. 26, 1980, Ser. No. 181,353

Claims priority, application United Kingdom, Sep. 13, 1979, 7931818

Int. Cl.³ B60C *23/02*; G08B *21/00*

U.S. Cl. 340—52 R **18 Claims**



1. A circuit for detecting the condition of an isolated switch contact comprising:

a first tuned circuit having a resonant frequency and including a first inductor, said switch contact being connected in parallel with said first tuned circuit; and

an oscillator circuit including means for continuously providing an oscillatory output when said switch contact is closed and inhibiting said oscillatory output when said switch contact is open, said means comprising an amplifier having a resistive negative feedback path and a positive feedback path shunted to "earth" by a further tuned circuit tuned to said resonant frequency and including a further inductor and a capacitor connected in parallel, and means for absorbing oscillations of the oscillator circuit in said first tuned circuit when said switch contact is open by at least intermittently magnetically coupling said first and further inductors.

4,350,972

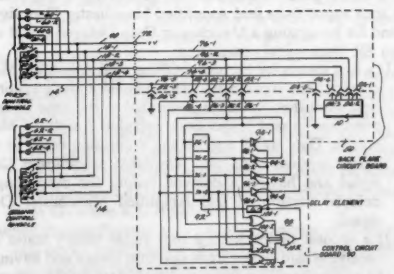
MULTIPLE CONSOLE CONTROL SYSTEM

Fred G. Perry, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed May 23, 1980, Ser. No. 152,824

Int. Cl.³ H04Q *9/00*

U.S. Cl. 340—825 **27 Claims**



1. A control system for selectively controlling a device, said device comprising a control common line and at least one switch line, said control system comprising:

a momentary action switch coupling said control common line to said switch line;

a memory element including an input coupled to said switch line and including an output, said memory element comprising a control input selectively operable to load information from said switch line to store information previously loaded;

means for selectively coupling said output of said memory element to said input; and

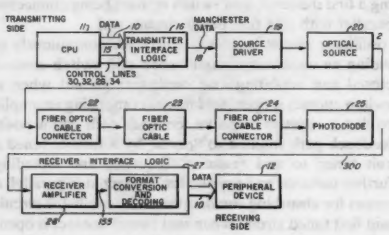
control means for causing said memory element to load information from said switch line while causing said means for selectively coupling to decouple said output of said memory element from the input thereof whenever the information at said input and output of said memory element are different, and for causing said memory element to store while causing said means for selectively coupling to couple said output of said memory element to said input thereof whenever the information at said input and output of said memory element are the same.

4,350,973

RECEIVER APPARATUS FOR CONVERTING OPTICALLY ENCODED BINARY DATA TO ELECTRICAL SIGNALS

Edward M. Petryk, Jr., Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jul. 23, 1979, Ser. No. 59,879
Int. Cl.³ H03K *13/00*
U.S. Cl. 340—347 DD **2 Claims**



1. A receiver apparatus for receiving optically transmitted binary data encoded in Manchester Code in serial format and preceded by a header signal and for decoding said data and converting it to parallel format digital data signals comprising:

(a) a photodiode means for converting light signals carrying said binary data to electrical signals encoded in Manchester Code as the Received Manchester Data signal;

(b) an amplifier means for amplifying said Received Manchester Data signal and for converting it to a digital Amplified Manchester Data signal;

(c) a clock generator means for generating a Recovered Clock signal from said Amplified Manchester Data signal and for generating a Manchester Data Delayed signal and an SR Data signal comprising:

(1) a first means for exclusive-ORing said Amplified Manchester Data signal with itself delayed a predetermined time such that a pulse is generated at the time of each transition in said Manchester encoded Amplified Manchester Data signal and having a duration equal to the delay imposed upon said Amplified Manchester Data signal and having a delayed output for outputting a delayed version of said Amplified Manchester Data signal;

(2) a second means having two stable binary states for receiving said pulses from said first means and having a Q output toggling from one said state to the other at each occurrence of said pulses and having an inverted output for generating a signal of the opposite binary state from that of the Q output, and having a reset input coupled through a first means for delay to said inverted output to reset said second means a predetermined time after said Q output assumes the logical one state;

(3) a second means for delay coupled to said delayed version of said Amplified Manchester Data signal for outputting a Manchester Data Delayed signal which is said delayed version of said Amplified Manchester Data signal delayed by a first predetermined delay, and for outputting an SR Data signal which is said Manchester Data Delayed signal delayed by a second predetermined delay;

(d) a header detector means for monitoring said Manchester Data Delayed signal to sense when a header signal appears therein signaling the commencement of data transmission, and for gating said Recovered Clock signal through said header detector means upon receipt of said header signal as a Data Clock output signal, and said header detector means for counting the number of Manchester encoded data bits received following said header signal and for generating a Data Latch signal when a predetermined number of said data bits has been received;

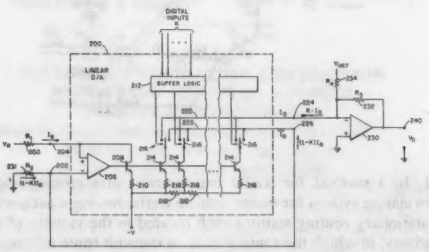
(e) a shift register means responsive to said SR Data and said Data Clock signals for receiving the Manchester encoded data bits in said SR Data signal serially at the rate of one data bit for every clock period of said Data Clock signal, and for gating said data in said shift register into a plurality of data latch storage buffers upon receipt of said Data Latch signal, said data latch storage buffers having parallel access output lines such that an external user device can read the data in said data latch storage buffers in parallel format.

4,350,974

LOGARITHMIC ANALOG-TO-DIGITAL CONVERTER

Bernard M. Gordon, Magnolia, and Hans J. Weedon, Salem, both of Mass., assignors to Analogic Corporation, Wakefield, Mass.

Continuation of Ser. No. 836,158, Sep. 23, 1977. This application Apr. 15, 1980, Ser. No. 140,662
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **3 Claims**



1. A logarithmic digital-to-analog converter for receiving a digital input signal and for providing as an output an analog signal representative of the anti-logarithm of the digital input signal comprising:

a first reference source to produce a first reference input signal;

a linear digital-to-analog converter having a digital input to receive a digital input signal, a reference input to receive a first reference input signal, an output terminal providing an output signal proportional to said digital input signal and said first reference input signal, a complement output terminal providing a complement output signal inversely proportional to said digital input signal and proportional to said first reference input signal wherein a sum of said output signal and said complement output signal is proportional only to said reference input signal, said complement output being connected to said first input source wherein

said complement output signal affects said first reference input signal;

a second reference source to produce a second reference input signal;

a summing amplifier means having an input to receive said first output signal and said second reference signal and to produce at an output a logarithmic analog output signal, said logarithmic analog output signal related to said first reference input signal and logarithmically related to said digital input signal;

wherein said complement output signal comprises a complement current;

said reference input further comprises a normally grounded input responsive to a feedback voltage and a forced input terminal operable by said summing amplifier to be maintained at a voltage substantially equal to said normally grounded input feedback voltage; and

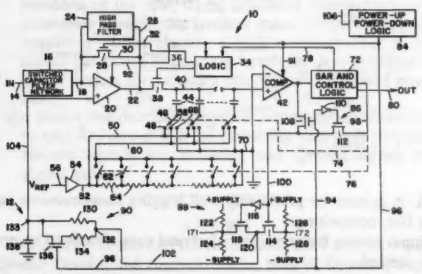
said first reference source further comprises a first reference voltage, a first resistor connecting said first reference voltage and said forced input, a second resistor connecting common ground to said complement output signal and said normally grounded input thereat forming said feedback voltage.

4,350,975

DUAL BANDWIDTH AUTOZERO LOOP FOR A VOICE FREQUENCY CODEC

Yusuf A. Haque, Santa Clara, and Richard W. Blasco, Campbell, both of Calif., assignors to American Microsystems, Inc., Santa Clara, Calif.

Filed Jul. 18, 1980, Ser. No. 170,041
Int. Cl.[3] H03K *13/08*
U.S. Cl. 340—347 CC **4 Claims**



1. An analog to digital converter circuit means for providing a digital representation of an analog input signal, said digital representation including an output sign bit indicating the polarity of said analog input signal, said converter means containing an operational amplifier having a first and a second input lead, and an autozero loop, said first input lead being connected to receive an analog input signal to be converted, said analog to digital converter capable of operating in either a power-up mode or a normal analog to digital conversion mode, said analog to digital converter comprising:

a power-up/power-down logic circuit for providing output signals characteristic of the present operating mode of said analog to digital converter;

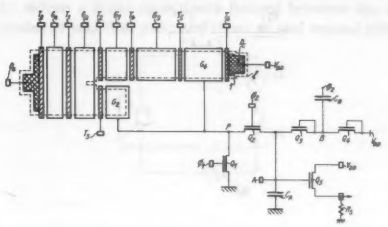
a dual-bandwidth sub-circuit means controlled by said power-up/power-down logic circuit for providing a feedback signal to said second operational amplifier input lead to null any D.C. offsets created by said analog to digital converter circuit, wherein said dual-bandwidth subcircuit operates with a relatively small time constant sufficient to cancel circuit offsets during a short power-up interval, and a relatively large time constant to continuously cancel variable circuit offsets during said normal analog to digital conversion mode of said analog to digital converter circuit without requiring interruption of the normal operation of the analog to digital converter circuit, wherein said feedback signal is obtained by said dual-bandwidth subcircuit integrating over time a selected voltage corresponding to the value of said output sign bit.

4,350,976

CHARGE-TRANSFER CODED-VOLTAGE GENERATOR FOR USE IN ANALOG-DIGITAL CODERS AND DECODERS

Roger Benoit-Gonin; Jean L. Berger, and Jean L. Coutures, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 10, 1980, Ser. No. 215,134
Claims priority, application France, Dec. 27, 1979, 79 31801
Int. Cl.[3] H03K *13/02*
U.S. Cl. 340—347 DA **9 Claims**



1. A charge-transfer coded-voltage generator for generating the voltages

$$V_R, V_{Ri}=a_0V_R+a_1\cdot V_R/2+a_2\cdot V_R/2^2+\ldots +a_{i-1}\cdot V_R/2^{i-1}+V_R/2^i,$$

where V_R is a reference voltage and where $i=1 \ldots n$ and in which said voltages make it possible by comparison with a voltage V_x to determine by successive approximations the coefficients $a_0 \ldots a_n$ which are equal to 0 or to 1 and such that $V_x=a_0V_R+a_1\cdot V_R/2+a_2\cdot V_R/2^2 \ldots +a_i V_R/2^i+ \ldots +a_n\cdot V_R/2^n$ or alternatively for generating the voltage $V_x=a_0V_R+a_1\cdot V_R/2+a_2\cdot V_R/2^2+ \ldots +a_i\cdot V_R/2^i+ \ldots +a_n\cdot V_R/2^n$ in the event that the coefficients $a_0 \ldots a_n$ are known, wherein said generator is constituted by a charge-transfer device comprising an alternate arrangement of storage gates and transfer gates together with:

a diode D_e placed at one end of the active region in which transfer and storage of charges take place, the function of said diode being to inject a reference quantity of charges $2Q_R$ at the beginning of processing of each sample V_x or of each series $a_0 \ldots a_n$ as well as to effect removal of surplus charges during the processing operation;

an insulating diffusion which divides into two equal parts the charges originating from a storage gate G_o located near the diode D_e and which divides the active region into two parallel channels downstream of the gate G_o;

in one channel, a storage gate G_2 beneath which the quantities of charges Q_R, $Q_R/2 \ldots Q_R/2^i \ldots$ are stored by successive two-trip traversals between gates G_o and G_2;

in the other channel, three storage gates G_1, G_3 and G_4, the quantity of charges $Q_R/2^i$ stored beneath gate G_1 and originating from gate G_o being transferred beneath said gate G_o and then removed beneath the diode D_e when a_i is zero in respect of $i=0 \ldots n$ and being transferred beneath gate G_3 when a_i is equal to 1;

when the coefficients $a_0 \ldots a_n$ are unknown, a charge-reading device connected to gates G_2 and G_4 and adapted to generate the reference voltage V_R at the time of transfer of the quantity of charges Q_R beneath gate G_2, thus permitting determination of a_o by comparison of the voltage V_R with the voltage V_x, then to generate $V_{R1}=a_oV_R+V_R/2$ at the time of transfer of the quantity

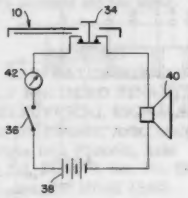
$Q_R/2$ beneath gate G_2 and, if $a_0=1$, at the time of any subsequent transfer of Q_R from gate G_3 to gate G_4, thus permitting determination of a_1 by comparison of the voltage V_{R1} with the voltage V_x, and so on until generation of V_{Rn} and determination of a_n or, when the coefficients $a_0 \ldots a_n$ are known, a charge-reading device connected to the gate G_4 for generating the voltage V_x by transfer of charges from gate G_3 to gate G_4 when the n coefficients of V_x have been processed.

4,350,977

ADAPTER FOR BURGLAR ALARM SWITCH

Coy M. Dykes, P.O. Box 572, LaFayette, Ga. 30728

Filed Sep. 28, 1981, Ser. No. 306,388
Int. Cl.[3] G08B *13/08*
U.S. Cl. 340—545 6 Claims



1. A device for use in a doorway in conjunction with a make and break switch of the spring-loaded, push-button type, the push-button switch forming part of a wired perimeter burglar alarm system, said device comprising:

a plate member;

mounting means, secured in a position for cooperation with the push-button switch, for providing a vertical trackway for sliding movement of said plate member between a first position for engaging the push-button switch when the door is closed to hold the push-button in a depressed condition and a second position where said plate member does not engage the push-button switch when the door is closed;

retaining means for selectively holding said plate member at said first position when the door is open; and,

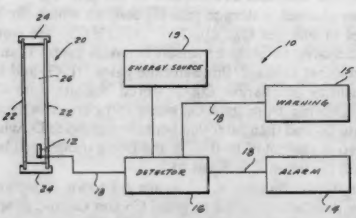
means for manually releasing said retaining means while the door is closed so that, upon opening the door, said plate moves to said second position.

4,350,978

HUMIDITY-SENSITIVE BROKEN PANEL ALARM

Paul J. Riccobono, 180 Grant Ave., Cresskill, N.J. 07626

Filed Apr. 24, 1981, Ser. No. 257,000
Int. Cl.[3] G08B *13/20*
U.S. Cl. 340—550 14 Claims



1. A burglar alarm system to detect the breaking of a pane of a humidity sealed multiple pane panel, comprising

(A) a humidity sensor, the status of said sensor being responsive to the humidity intermediate the panes of the humidity sealed multiple pane panel;

(B) alarm means; and

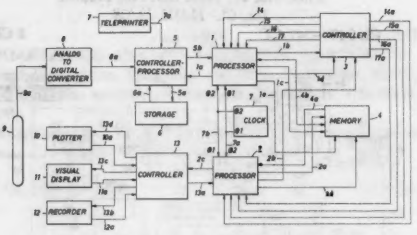
(C) detector means operably connected to said sensor and said alarm means and adapted to actuate said alarm means in response to a predetermined status of said sensor, said detector means being capable of discriminating between a gradual and a sharp rate of increase in the humidity indicated by the status of said sensor, said detector means initiating a first action in response to a sharp rate and a second action in response to a gradual rate.

4,350,979

SYSTEM AND METHOD FOR WELL-LOGGING

Valery D. Eberwein, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 949,592, Oct. 10, 1978. This application Apr. 13, 1979, Ser. No. 30,056
Int. Cl.[3] G01V *1/40*
U.S. Cl. 340—861 20 Claims



1. A system for processing well logging measurements and the like, comprising:

input means for providing electrical data signals to be processed,

terminal means for receiving processed electrical data signals,

pulse generating means for providing first and second electrical enabling pulse trains, said first pulse train being substantially 180 degrees out of phase from said second pulse train,

memory means for receiving and delivering electrical data signals,

first processing means interconnected with said input and memory means,

second processing means interconnected with said memory and terminal means, and

control means for generating and delivering command signals to said first and second processing means, wherein

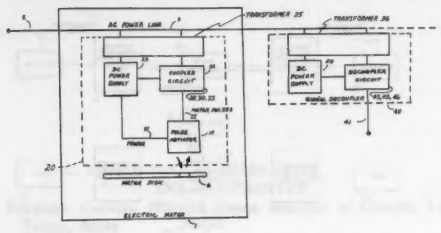
said first processing means receives and delivers data signals in response to said first pulse train and selected ones of said command signals and processes said received data signals in response to other different selected ones of said command signals and said second pulse train, and

said second processing means receives and delivers data in response to said second pulse train and said selected one of said command signals and processes said received data in response to said other different selected ones of said command signals.

4,350,980
ELECTRIC METER CONSUMPTION AND DEMAND COMMUNICATOR

Steven M. Ward, El Paso, Tex., assignor to Energy Optics, Inc., Las Cruces, N. Mex.

Filed Feb. 21, 1980, Ser. No. 123,216
Int. Cl.³ G08C 9/06; H04Q 9/10
U.S. Cl. 340—870.02 13 Claims



1. An electric meter comsumption and demand communicator system for use with a Watt hour utility meter of the rotational disc type, for metering an AC power line, said communicator system comprising in combination:

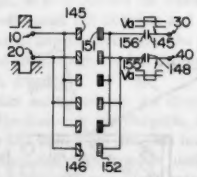
power line encoder-coupler circuit means for extracting power from the AC power line within the meter or adjacent thereto to establish a DC power source and including non-contact power consumption and demand monitoring means deriving current from said meter disc and pulse initiator means effective to generate electronic digital pulses in a predetermined relationship to the number of rotations of the disc, signal generator means electrically connected to said pulse initiator means for producing high frequency coded electric signals corresponding to said digital pulses and connecting to the AC power line of the meter system for inducing said signals upon said power line;

and power line decoder-decoupler circuit means connecting to said AC power line for extracting said high frequency electric signals and restoring said electric signals into digital pulses.

4,350,981
CAPACITIVE ROTATIONAL POSITION DETECTOR

Hiroaki Tanaka, and Sigeyuki Akita, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 16, 1980, Ser. No. 159,855
Claims priority, application Japan, Jul. 2, 1979, 54-84288
Int. Cl.³ G08C 19/10
U.S. Cl. 340—870.37 3 Claims



1. A rotational position detecting apparatus comprising:

a first plate made of insulating material which has on one surface thereof first and second electrodes of metal film alternately and circumferentially arranged at equal intervals in a radial direction thereof and electrically insulated from each other;

a second plate made of insulating material which has on one surface thereof electrodes of metal film which are circumferentially arranged at equal intervals in a radial direction thereof to oppose the first and second electrodes of the first plate and which are electrically connected to a first and a second circular electrode;

a rotation detecting circuit for detecting relative rotation of the first and second plates in accordance with the static capacitance change occuring between the electrodes of the first and second plates as one of the plates rotates;

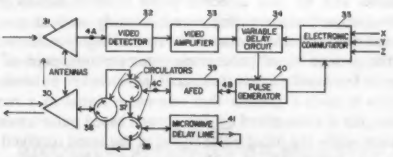
a plurality of apertures provided in at least one of the plates and corresponding to the first and second electrodes which are alternately arranged on the one surface of one of the plates; and

connecting metal films provided on the other surface of the first plate at which the apertures are bored, said connecting metal films electrically and alternately connecting the first and second electrodes through the apertures, in order to reduce a static capacitance formed between the electrodes of said first plate and those of said second plate.

4,350,982
FREQUENCY-AGILE TRANSPONDER

Frederick C. Alpers, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 3, 1974, Ser. No. 476,164
Int. Cl.³ G01S 13/80
U.S. Cl. 343—6.8 R 6 Claims



1. A transponder comprising;

input means adapted to receive a microwave pulse;

said input means comprising a first antenna;

repeater means adapted to repeat backwards after a short and controllable delay a microwave pulse fed to it coupled to said input means;

triggering means coupled to said repeater means for causing said repeater means to output backwards a microwave pulse fed to it;

another antenna for receiving microwave pulses therefrom;

detector means coupled to said another antenna and having an output;

variable delay means operatively coupled to the output of such detector means and having an output therefrom;

said variable delay means output being coupled as an input to said triggering means;

isolation means operatively coupled between said first antenna and said repeater means; and

a microwave delay line operatively coupled to said isolation means so that outputs from the microwave delay line are periodically coupled back as an additional input to the repeater means so that a predetermined series of response pulses are emitted from said antenna.

4,350,983

NAVIGATION METHOD FOR PRECISELY STEERING A FLYING OBJECT

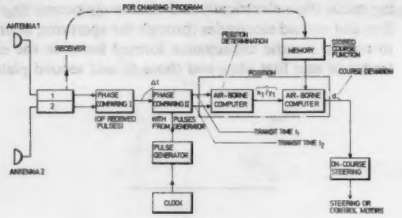
Alfred Blaha, Haar, and Hans-Juergen Schwärzler, Taufkirchen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Mar. 16, 1979, Ser. No. 21,023

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1978, 2813189

Int. Cl.³ G01S *1/24*

U.S. Cl. 343—103 6 Claims



1. A method for navigating a flying object, comprising the steps of establishing at least two ground based pulse transmitter stations at a given distance from each other, providing the flying object with airborne pulse receiver means, providing each of said ground based pulse transmitter stations and said airborne pulse receiver means of said flying object with a respective high precision clock, said high precision clocks having a common time base for said ground based transmitter stations and for said airborne pulse receiver means of said flying object, transmitting simultaneously and at predetermined points of time as controlled by said high precision clocks in the ground based pulse transmitter stations, pairs of pulse signals from said ground stations to said airborne pulse receiver means in such a manner that one pulse signal of a received pulse pair is transmitted by one ground based pulse transmitter station while the other pulse signal of the same received pulse pair is transmitted by the other ground based pulse transmitter station, said airborne high precision clock making said predetermined transmitting time points available in said flying object in the form of time base signals, measuring the time difference (Δt) between the receipts of two pulses forming said received pulse pair of pulse signals by ascertaining in a first comparing step (Phase Comparing I) the phase difference between the pulse signals forming said received pulse pair, measuring the absolute transit times (t_1 and t_2) of the pulse signals of a received pulse pair from said ground based transmitter stations to said airborne pulse receiver means by performing a second comparing step (Phase Comparing II) in which said time difference (Δt) between the pulses of a received pulse pair is compared with said time base signals from said airborne high precision clock, trigonometrically calculating from said absolute transit times (t_1 and t_2) and from said time difference (Δt) the instantaneous distances of said flying object from each of said ground based stations, determining from said distances the instantaneous position coordinates of said flying object, comparing in a third comparing step said instantaneous position coordinates with a rated course function stored in respective memory means in said flying object to produce a course deviation signal (d), and supplying said course deviation signal (d) to airborne autopilot means.

4,350,984

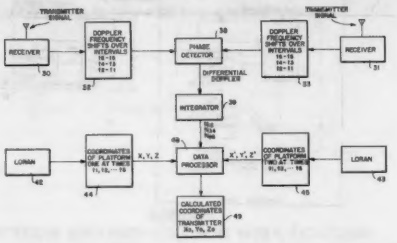
METHOD OF POSITION FIXING ACTIVE SOURCES UTILIZING DIFFERENTIAL DOPPLER

Robert H. Fisher, Bowie, Md., assignor to The United States of America as represented by the Director of the National Security Agency, Washington, D.C.

Filed Jun. 5, 1969, Ser. No. 831,279

Int. Cl.³ G01S *3/02*

U.S. Cl. 343—112 R 9 Claims



1. A method of position fixing an active transmitter source comprising:

moving at least two passive receivers along a given measurement path of receiver movement;

obtaining navigational information during selected measurement intervals along the measurement path of movement, the navigational information indicating the positions of the receivers during the selected intervals;

receiving doppler frequency shifts of the active source transmitter frequency, at the passive receivers during the selected intervals;

obtaining the difference of the doppler frequency shifts received during the selected intervals, the differential doppler being a constant for each point of measurement during the selected intervals; and

processing the obtained navigational and the received differential doppler frequency shifts to obtain the position of the active source.

4,350,985

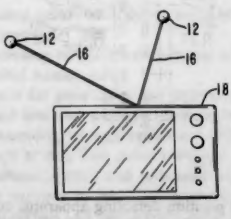
EYE PROTECTOR FOR TELEVISION SET ROD ANTENNA

Edward A. Arrigoni, 712 Kamuela Ave., Honolulu, Hi. 96816

Continuation of Ser. No. 844,005, Oct. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 797,719, May 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 776,148, Mar. 10, 1977, abandoned. This application Mar. 3, 1980, Ser. No. 126,767

Int. Cl.³ H01Q *1/24*

U.S. Cl. 343—702 1 Claim



1. An eye protector for the antenna shaft of a television set comprising: a body of resilient, foam plastic material, the body having a passage extending into the same from the outer periphery thereof, the passage having a fastener extending thereinto, the fastener adapted to be mounted on the antenna shaft

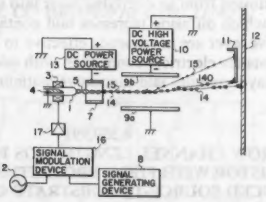
and provided with an expandable end movable laterally and into the body for frictional engagement therewith, the fastener being tubular and having a first slit extending along the length of the fastener and a second slit extending only partially along the length of the fastener, there being recess means at one end to define a pair of separable parts, the parts being separated when engaged by a projection on the outer end of the antenna shaft as the fastener moves along and outwardly of the antenna shaft and when it is disposed within the passage of said body.

4,350,986

INK JET PRINTER

Takahiro Yamada, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 746,157, Nov. 30, 1976, Pat. No. 4,068,241. This application Sep. 7, 1977, Ser. No. 831,142
Claims priority, application Japan, Sep. 11, 1976, 51-109220
The portion of the term of this patent subsequent to Jan. 10, 1995, has been disclaimed.
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **7 Claims**



1. An ink jet printer, comprising:

nozzle means for emitting pressurized ink in a stream towards a recording surface,

vibration exciting means connected to said nozzle means for applying to the ink mechanical vibrations of a magnitude at which said ink stream severs alternately into large-diameter ink droplets and small-diameter ink droplets at a fore end part thereof,

means for generating a recording electric signal,

control means for varying the vibration exciting intensity of said vibration exciting means on the basis of said recording electric signal, so as to control the relative flight velocities of the large-diameter ink droplets and the small-diameter ink droplets and thereby to control the position of possible union of said small-diameter ink droplets with said large-diameter ink droplets,

deflection means acting on the ink droplet flight paths so that said large-diameter ink droplets, said small-diameter ink droplets and united ink droplets formed by said large- and small-diameter ink droplets uniting may proceed along respectively different flight paths, and

shield means for intercepting the flight path of either of said large-diameter ink droplets and the united ink droplets and the flight path of said small-diameter ink droplets,

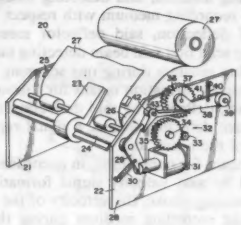
said control means including means for varying the vibration exciting intensity in response to the recording electric signal so that the ink droplets corresponding to recording dots may avoid said shield means and reach the recording surface.

4,350,987

PRINTING DEVICE

Takayoshi Hanagata, and Atsushi Noda, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1980, Ser. No. 180,102
Claims priority, application Japan, Aug. 31, 1979, 54-111273
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **3 Claims**



1. A printing device comprising:

a print head for performing printing on a recording paper;

urging means for causing said print head to rotate towards and be urged into contact with said recording paper;

paper forwarding means having a manual paper forwarding function and, at the time of the manual paper forwarding operation and under the action of a force derived from the manual paper forwarding function, for causing said print head to rotate away from said recording paper against the force exerted by said urging means toward the recording paper, wherein said paper forwarding means comprises:

a paper forwarding rotary member with a paper forwarding power transmission wheel fixedly provided at one end of a rotational shaft thereof;

a manual paper forwarding rotary member urged away from said power transmission wheel by a spring and movable to engage with said power transmission wheel against the force of said spring to thereby impart a paper forwarding force; and

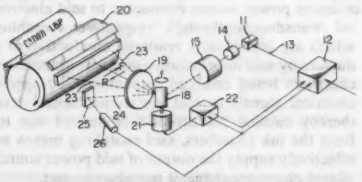
a transmission member engagable with said urging means when said manual member moves into engagement with said power transmission wheel to thereby cause said print head to rotate away from said recording paper.

4,350,988

RECORDING APPARATUS FOR EFFECTING RECORDING BY A BEAM

Koichi Masegi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 943,740, Sep. 19, 1978, abandoned. This application Apr. 28, 1980, Ser. No. 144,218
Claims priority, application Japan, Sep. 27, 1977, 52-115861
Int. Cl.³ G01D *15/14*
U.S. Cl. 346—108 **20 Claims**



1. A recording apparatus for effecting recording by a beam, comprising:

beam formation means for forming a beam modulated by a modulation signal;

deflector means having a deflecting member for deflecting the beam;

a recording medium located within the deflection range of said deflector means and adapted to be irradiated with the beam when deflected in one direction and on which the irradiation track of the beam is recorded;

beam detecting means provided within the deflection range of said deflector means but outside the area defined by said recording medium, said detecting means being upstream of said recording medium with respect to said one direction of deflection, said deflector means deflecting the beam to scan first said beam detecting means and then said recording medium during one scanning stroke;

velocity signal formation means for forming, in response to the beam, deflected by said deflecting member sweeping said beam detecting means, a signal representing the velocity of the beam; and

control means for controlling, in accordance with the signal formed by said velocity signal formation means during one scanning stroke, the velocity of the beam when scanning said recording medium during the same scanning stroke.

4,350,989

INK-JET PRINTING APPARATUS

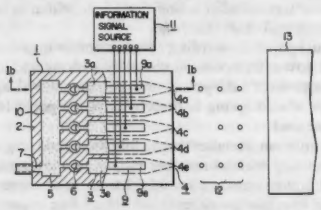
Syoji Sagae, Hitachiota; Yasumasa Matsuda, Hitachi; Masatoshi Kasahara, Hitachi, and Masayoshi Suzuki, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Mar. 13, 1980, Ser. No. 130,188

Claims priority, application Japan, Mar. 19, 1979, 54/31133

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **4 Claims**



1. An ink-jet printing apparatus which is arranged such that a plurality of nozzles for projecting ink droplets are provided and the ink droplets projected therefrom are selectively deposited on a recording medium in accordance with an information signal so as to form a desired printed pattern, said ink-jet printing apparatus comprising:

a plurality of ink chambers defining pressure chambers;

orifices communicating with said ink chambers;

electromechanical transducers provided opposing to said ink chambers;

a common power source connected to said electromechanical transducers through respective switching means which are individually rendered conductive or non-conductive by said information signal, the volumes of said ink chambers being changed respectively by application of electrical signals to said electromechanical transducers, thereby causing ink droplets of desired size to project from the ink chambers, said switching means serving to selectively supply the output of said power source to each of said electromechanical transducers; and

an impedance element connected in parallel with each of said switching means between said common power source and each of said electromechanical transducers and having an impedance value equal to or larger than the impedance of the associated electromechanical transducer, so as to supply an electrical signal of low voltage to each electromechanical transducer when the associated switching means is non-conductive without causing ink droplets to be generated at that time.

4,350,990

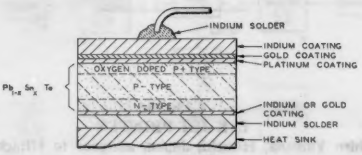
ELECTRODE FOR LEAD-SALT DIODES

Wayne Lo, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 15,946, Feb. 28, 1979, abandoned. This application May 16, 1980, Ser. No. 150,248

Int. Cl.³ H01L *29/161, 29/205, 29/225*

U.S. Cl. 357—16 **15 Claims**



1. In a lead-salt semiconductor diode having a P type region at one surface and a nonrectifying laminated contact on said surface of a noble metal and indium, the improvement wherein the region has an oxygen doping adjacent said surface that reduces contact resistance at said surface, said surface has successive adherent layers of platinum and gold thereon over said oxygen doped region effective to substantially block indium diffusion from an overlying layer into said oxygen doped region, which diffusion increases said contact resistance, said successive layer are in sequence effective to initially provide a low resistance electrical connection with said surface, and the indium layer overlies said successive platinum and gold layers.

4,350,991

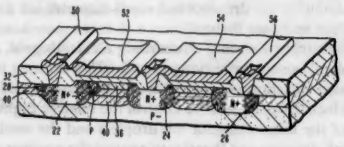
NARROW CHANNEL LENGTH MOS FIELD EFFECT TRANSISTOR WITH FIELD PROTECTION REGION FOR REDUCED SOURCE-TO-SUBSTRATE CAPACITANCE

William S. Johnson, Scotsdale, Ariz., and Ronald W. Knepper, LaGrangeville, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 867,559, Jan. 6, 1978, abandoned, which is a division of Ser. No. 711,947, Aug. 5, 1976, Pat. No. 4,078,947. This application Jun. 22, 1979, Ser. No. 51,465

Int. Cl.³ H01L *29/78*

U.S. Cl. 357—23 **4 Claims**



1. In a metal-oxide-semiconductor field-effect transistor comprising

a semiconductor body of a first conductivity type and having a relatively light first dopant concentration,

a pair of mutually-spaced source and drain regions of opposite conductivity type and formed within said body adjacent the surface thereof,

means to make electrical contact to said source and drain regions,

an enhancement channel region of said first conductivity type and having a relatively heavy dopant concentration higher than said first concentration,

a depletion channel region of said opposite conductivity type,

conrol means adjacent said depletion channel region,

said enhancement channel region extending from said source region in a direction toward said drain region,

said depletion channel region extending from said enhancement channel region to said drain region,

the improvement wherein:

a field protection region of said first conductivity type and having a dopant concentration higher than said first concentration extends between said pair of mutually-spaced source and drain regions beneath said depletion channel region, and

said source region is formed within said enhancement channel region and extends to a greater depth than the latter and into said semiconductor body so that a portion of the peripheral area of the source region is adjacent to and forms a junction with said semiconductor body,

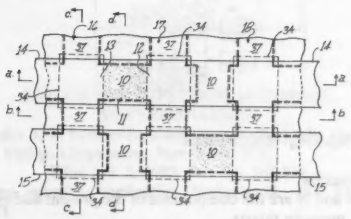
whereby the source-to-substrate capacitance of the device is determined primarily by the relatively light dopant concentration of said body instead of the relatively heavy dopant concentration of said enhancement channel region, thereby providing substantially increased speed of operation.

4,350,992

N-CHANNEL SILICON GATE VIRTUAL GROUND ROM

Graham S. Tubbs, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 5, 1979, Ser. No. 82,247
Int. Cl.³ H01L *27/10*; G11C *11/40*
U.S. Cl. 357—23 **10 Claims**



1. A read only memory array comprising:

a plurality of memory cells formed at a face of a silicon body in an array of rows and columns;

each memory cell including an insulated gate field effect transistor having a source, a drain and a polysilicon gate, the gate being insulated from the silicon by a thin gate insulator for selected ones of the memory cells; and

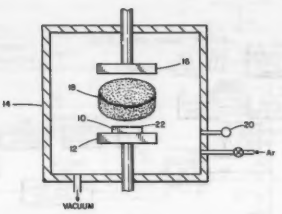
interconnections to the sources and drains formed by column lines partially underlying row lines on the face, the row lines being polysilicon strips generally perpendicular to the column lines and forming said gates, thick field oxide underlying the gate for remaining memory cells other than said selected ones of the memory cells to alter substantially the threshold of the transistors of such remaining cells compared to the transistors of said selected ones of the memory cells, the thick field oxide extending ipto said face to a depth greater than that of said thin gate insulator, said column lines including diffused regions self-alligned with the row lines and heavily doped implanted regions underlying the row lines and extending out from beneath the row lines to spaces between the rows lines, the diffused regions and the implanted regions together creating continuous conductive paths to form the column lines, the thick field oxide being formed in said face between the column lines but not overlying the column lines.

4,350,993

HETEROJUNCTION AND SCHOTTKY BARRIER EBS TARGETS

Herman H. Wieder, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 16, 1980, Ser. No. 160,034
Int. Cl.³ H01L *27/14*
U.S. Cl. 357—29 **20 Claims**



1. In an apparatus for modulating the current flow between a source electrode and a drain electrode in a metal field effect transistor at rates up to and including microwave frequencies, an improvement therefor is provided; comprising:

an electron transparent gate mounted on the metal field effect transistor and coupled to an electric field source for changing the current flow between the source electrode and drain electrode by the electric field, the electron transparent gate is dimensioned and fabricated from a material having the property of being substantially transparent to the passage of electrons and

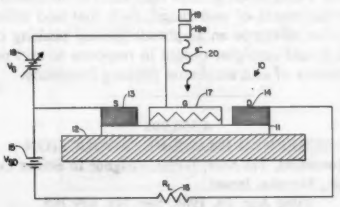
means disposed adjacent the electron transparent gate for directing modulating electrons therethrough and into the metal field effect transistor to further modulate the current flow between the source electrode and drain electrode in response to the electron beam at said rates up to and including microwave frequencies.

4,350,994

SEMICONDUCTOR DEVICE HAVING AN AMORPHOUS METAL LAYER CONTACT

John H. Perepezko, and John D. Wiley, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Oct. 4, 1979, Ser. No. 81,859
Int. Cl.³ H01L *23/48, 29/46, 29/62*
U.S. Cl. 357—67 **10 Claims**



1. A semiconductor device for high temperature use comprising a semiconductor as a base and a layer strongly bonded to the surface of the base consisting essentially of an alloy in the amorphous non-crystalline state of a metal selected from the group consisting of a transition metal, transition metal/normal metal alloy, refractory metal and refractory metal/normal metal alloy, in which the amorphous metal layer has a crystallization temperature and stable microstructure at temperatures

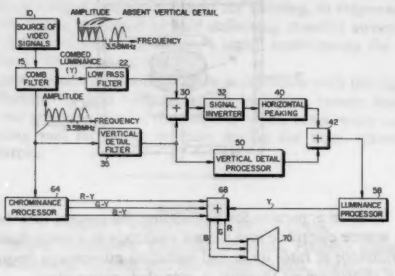
above 500° C., said amorphous metal layer being resistant to interdiffusion with the base.

4,350,995

SELF-LIMITING VIDEO SIGNAL PEAKING CIRCUIT

Wayne E. Harlan, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 20, 1981, Ser. No. 255,982
Int. Cl.³ H04N 5/14
U.S. Cl. 358—37 7 Claims



1. A video signal peaking network exhibiting a given amplitude versus frequency response including a frequency at which maximum signal peaking is produced, comprising:

a source of video signals to be peaked including periodic and aperiodic amplitude transitions of varying magnitudes occupying a given range of transition magnitudes;

a signal delay network with an input coupled to said source of video signals and an output, said delay network being terminated to operate in a reflective mode and exhibiting a signal delay for determining said maximum signal peaking frequency;

a differential amplifier with a first input coupled to said delay network input and a second input coupled to said delay network output, for developing a peaking component at an output;

a combining network for combining delayed signals from said delay network output with said peaking component from said differential amplifier output, for providing a peaked video signal; and wherein

said differential amplifier (1) exhibits a linear response for aperiodic transitions of magnitudes throughout said range, and (2) exhibits a non-linear response for periodic transitions recurring at said maximum peaking frequency and having a magnitude greater than half the maximum transition magnitude of said range, such that said differential amplifier develops an amplitude limited peaking component at said amplifier output in response to said periodic transitions of said maximum peaking frequency.

4,350,996

SCREENED IMAGE REPRODUCTION

Gideon Rosenfeld, Tel-Aviv, Israel, assignor to Scitex Corporation Ltd., Herzlia, Israel

Filed Apr. 14, 1980, Ser. No. 139,705
Int. Cl.³ H04N 1/46
U.S. Cl. 358—75 18 Claims

1. The method of producing a screened color separation having any screen angle (A) comprising the steps of

A. scanning a color original pixel by pixel and line by line to produce a set of picture values, the adjacent scan lines having a selected step (SS) between them,

B. digitizing and storing said picture values,

C. scanning and exposing a reproduction member resolution element by resolution element and line by line in response to exposure signals, the adjacent exposure scan lines having a selected step (ES) between them,

D. generating screen values representing the grey-tone values in a complete period in the orthogonal directions (m and n) of a periodic half-tone screen, said screen period being in the form of a grid defined by orthogonal m and n rulings, the distance between adjacent rulings having a value (CS) less than (ES), the different screen values being assigned to different locations in the grid,

E. storing the screen values in a memory matrix at locations having memory addresses corresponding to the locations of the screen values in the grid,

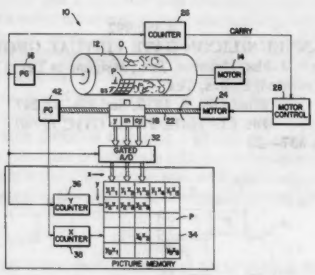
F. recalling the screen values from the memory matrix by

(1) computing the memory address components corresponding to each memory location in accordance with the following equations:

$$M^* = M + S \sin A \bmod m$$

$$N^* = N + S \cos A \bmod n$$

$$M_{SI^*} = M_{SI} + S \cos A \bmod m$$



$$N_{SI^*} = N_{SI} - S \sin A \bmod n$$

wherein:

M and N are the components of the present address in the memory matrix,

S is the ratio of the exposing step (ES) to the screen cell step (CS),

M_{SI} and N_{SI} are the components of the address in the memory matrix used to expose the first resolution element in the present line, and

mod m and mod n signify the address calculations using modulo m and n arithmetic, and

(2) rounding off each computed memory address component M^*, N^*, M_{SI^*}, N_{SI^*} to a whole number corresponding to an actual memory address before addressing the memory matrix,

G. recalling the picture values in the order in which the picture was scanned, and

H. comparing the recalled screen values with the recalled picture values to produce said exposure signals for exposing the reproduction member.

4,350,997

LAY-OUT RECORDING METHOD IN A PICTURE SCANNING RECORDING SYSTEM

Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

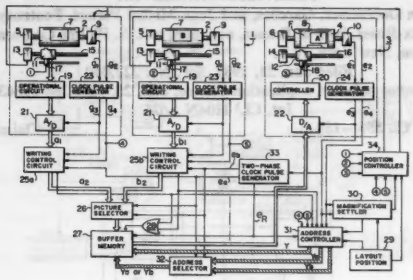
Filed Oct. 21, 1980, Ser. No. 199,341
Claims priority, application Japan, Oct. 23, 1979, 54-135879
Int. Cl.³ H04N 1/46; G03F 3/00
U.S. Cl. 358—78 15 Claims

1. A lay-out recording method in a picture scanning recording device, comprising the steps of:

obtaining picture signals concurrently from a plurality of original pictures with corresponding photoelectrical pick-up heads,

storing the picture signals, for subsequent extracting of said signals serially

writing the time series picture signals into specific addresses of a memory device, and



recording a plurality of reproduced pictures from the original pictures on a photo-sensitive film each at a desired magnification factor while selecting the addresses of the memory device from which the picture signals are to be recorded and the speed of each of the pick-up heads relative to the speed of a recording head when reading out the picture signal from the memory device in a consecutive manner.

4,350,998
DEVICE FOR DIFFERENTIAL IMAGE DETERMINATION

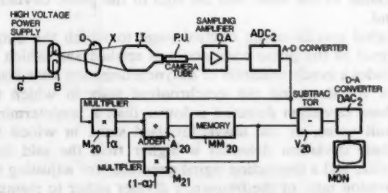
Leonardus A. J. Verhoeven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 2, 1980, Ser. No. 165,174

Claims priority, application Netherlands, Jul. 19, 1979, 7905611

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—111 **5 Claims**



1. In a device for processing images which have been separated into image elements of the type which comprises a memory for storing the image elements and subtraction means for subtracting corresponding image elements in a current image and in a previously determined image; the improvement comprising:

multiplying and addition circuits connected with the memory to form recursive filter means which function to multiply information received from the current image by a factor α, to multiply image information received from an output of the memory by a factor $(1-\alpha)$, where $0 \leqq \alpha \leqq 1$, to add the resulting products on an elemental basis, and to supply the resulting sum to an input of the memory.

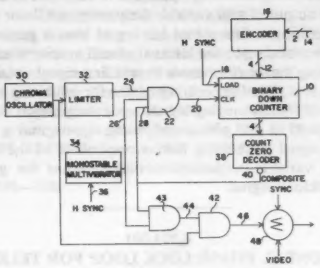
4,350,999
VIDEO FORMATTED DIGITAL DATA TRANSMISSION METHOD AND APPARATUS

Thomas J. Mortimer, Amherst, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Mar. 4, 1980, Ser. No. 127,165

Int. Cl.³ H04N *9/46*

U.S. Cl. 358—147 **13 Claims**



1. Apparatus for transmitting digital information in conjunction with standard television signals, comprising:

a chroma oscillator for providing cycles of color burst signal;

means coupled to said chroma oscillator for limiting the number of cycles of color burst signal to be transmitted to a predetermined number which varies in accordance with the digital information to be transmitted; and

means for combining said predetermined number of cycles of color burst signal with synchronization and video signals.

4,351,000
CLOCK GENERATOR IN PCM SIGNAL REPRODUCING APPARATUS

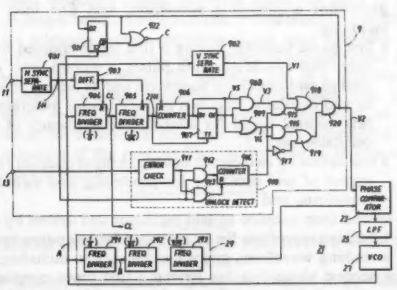
Hiromu Tokumatsu, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Dec. 10, 1980, Ser. No. 214,873

Claims priority, application Japan, Dec. 14, 1979, 54-173825[U]

Int. Cl.³ H03B *3/04*; H04N *5/05, 5/78*

U.S. Cl. 358—158 **10 Claims**



1. A clock generator for generating clock signal for reproducing PCM signal inclusive of synchronizing signal, comprising:

synchronizing signal separating means for separating said synchronizing signal from said PCM signal,

variable-frequency oscillator means,

first frequency dividing means for frequency dividing an oscillation output signal from said variable-frequency oscillator means,

phase comparing means for phase comparison between the output of said synchronizing signal separating means and the output of said frequency dividing means,

oscillation frequency controlling means responsive to the output of said phase comparing means for controlling the oscillation frequency of said variable-frequency oscillator means,

first signal generating means including first counter means for excuting counting operation in response to the oscillation output of said variable-frequency oscillator means for generating a first signal having at least a period of time corresponding to the interval of said synchronizing signal,

inhibiting means responsive to said first signal obtained from said first signal generating means for inhibiting the output of said synchronizing signal separating means from being supplied to said phase comparing means, and

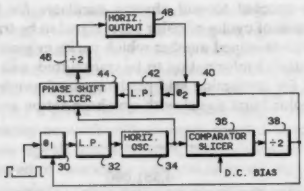
clock signal generating means responsive to the output of said variable-frequency oscillator means for generating said clock signal.

4,351,001

HORIZONTAL PHASE LOCK LOOP FOR TELEVISION

Michael McGinn, Tempe, and Gerald K. Lunn, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 29, 1980, Ser. No. 220,608
Int. Cl.³ H04N 5/04
U.S. Cl. 358—158 **13 Claims**



1. A horizontal phase lock loop for use in a television receiver of the type which receives horizontal synchronization pulses at the picture line frequency and which includes a horizontal output stage for generating flyback pulses, comprising:

an oscillator for generating a signal at a frequency substantially equal to twice said line frequency;

a first loop which includes said oscillator for locking said oscillator to said horizontal synchronization pulses and for generating a switching waveform, said first loop also including:

a first phase detector having a first input coupled to receive said synchronization pulses, a second input coupled to said switching waveform and an output coupled to said oscillator, said first phase detector generating a first control signal for altering the frequency of said oscillator; and

a first divide by two circuit having an input coupled to the output of said oscillator for producing said switching waveform; and

a second loop coupled to said oscillator and driven by said switching waveform for locking said flyback pulses to said switching waveform, said second loop also including:

a second phase detector having a first input coupled to said switching waveform and a second input coupled to receive said flyback pulses for generating a second control signal;

first means having a first input coupled to said signal and second input coupled to said second phase detector for slicing said signal in accordance with said second control signal and producing a second signal having a frequency substantially equal to said signal; and

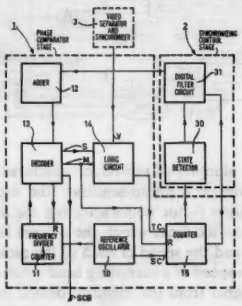
a second divide by two circuit having an input coupled to the output of said first means and an output coupled to said horizontal output stage for producing a fifty percent duty cycle drive wave form having a frequency substantially equal to said line frequency.

4,351,002

CIRCUIT FOR CORRECTING PHASE DEVIATIONS BETWEEN THE LINE DEFLECTION DRIVE SIGNALS AND THE LINE SYNCHRONIZING SIGNALS IN A TELEVISION RECEIVER

Alain Decraemer, Garches, and Jean-Michel Pernot, Fontenay-aux-Roses, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 21, 1981, Ser. No. 227,040
Claims priority, application France, Jan. 25, 1980, 80 01643
Int. Cl.³ H04N 5/04
U.S. Cl. 358—158 **7 Claims**



1. A circuit for corresponding phase deviations between the line deflection drive signals and the line synchronising signals in a television receiver, comprising:

a digital phase comparison stage including a reference oscillator producing periodic pulses of a frequency which is higher than the line frequency, a frequency divider provided at the output of said oscillator for producing line deflection drive signals and a phase comparator which receives at a first input the output signals of the frequency divider and at a second input the line synchronising signals received by the receiver and which produces from the phase deviation detected between said received signals from a digital signal, the value and the sign of which are related to the value and the sign of the phase deviation; and

a digital synchronising control stage to which the output signal of the phase comparator is applied and which includes a synchronisation or desynchronisation state detector for detecting the synchronized state in which the phase deviation detected is lower than a predetermined limit value, or the unsynchronised state, in which the phase deviation detected is higher than the said limit value, and a correction signal generator for adjusting the division ratio of the frequency divider either to maintain the synchronised state of the receiver when the detector has detected the existence of this state, or to try to obtain this state when the detector has detected the opposite state, the unsynchronised state, of the receiver.

4,351,003

AUTOMATIC VIDEO SIGNAL PEAKING CONTROL

Wayne E. Harlan, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

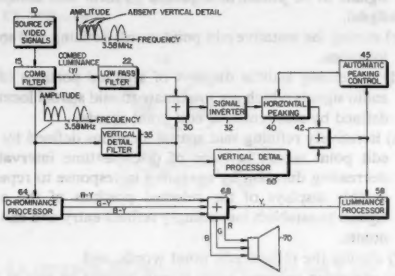
Filed Apr. 20, 1981, Ser. No. 255,609
Int. Cl.³ H04N 5/14
U.S. Cl. 358—166 **17 Claims**

1. In a video signal processing system including a source of video signals with image representative luminance and chrominance signal components, said system including means for

separating said luminance signal component from said video signal; apparatus for automatically controlling the high frequency peaking content of said luminance signal, comprising:

signal peaking means responsive to said luminance signal for generating a peaking signal component;

means for combining said peaking component with said luminance signal to produce a peaked luminance signal with accentuated high frequency components;



means responsive to said peaked luminance signal for developing a control signal in accordance with the magnitude of high frequency components of said peaked luminance signal; and

means coupled to said peaking means and responsive to said control signal for controlling the magnitude of said peaking component and thereby the magnitude of accentuated high frequency luminance components in accordance with the level of said control signal.

4,351,004

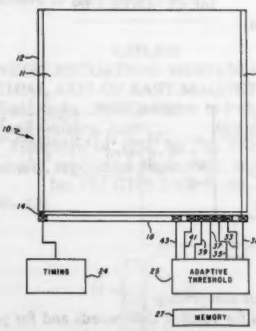
CCD IMAGER

William C. Choate, Dallas, and David S. Ho, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 31, 1980, Ser. No. 117,178

Int. Cl.³ H04N *3/14*

U.S. Cl. 358—213 **12 Claims**



1. A CCD imager, said imager having a plurality of CCD's arranged into columns and rows, each CCD representing a pixel in said imager, each of said CCD pixels capturing an analogue signal, means for reading the analogue signal in each CCD pixel, and means for providing an adaptive threshold for the analogue signal captured by each CCD pixel, including means responsive to said adaptive threshold means for converting the analogue signal in each CCD pixel into a digital signal, wherein said adaptive threshold means includes means for sensing the analogue signal in a predetermined CCD pixel, means for sensing the analogue of at least one closely adjacent CCD pixel, means for comparing the amplitude of analogue signal from said predetermined CCD pixel and a predetermined percentage of the amplitude of the analogue signal from said closely adjacent CCD pixel, and means for converting said analogue signal from said predetermined CCD pixel into a digital signal as a result of said comparison.

4,351,005

RECORDING APPARATUS

Nobuhiro Imai; Kimio Kono; Kazuo Hoshito, all of Kawasaki; Takehiko Kiyohara, Zama, and Hideaki Sato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

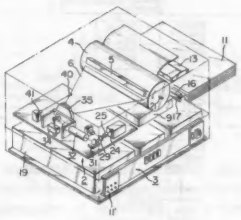
Continuation of Ser. No. 915,079, Jun. 13, 1978, abandoned.

This application Aug. 18, 1980, Ser. No. 179,174

Claims priority, application Japan, Jun. 21, 1977, 52-74225; Jul. 1, 1977, 52-79313; Aug. 3, 1977, 52-93500

Int. Cl.³ H04N *1/30*

U.S. Cl. 358—300 **31 Claims**



1. A recording apparatus comprising:

a beam generating means for generating a beam modulated by a modulating signal supplied thereto;

a deflecting means for reciprocatingly deflecting the beam generated by said beam generating means repeatedly in two directions;

a recording member for receiving said beam deflected by said deflecting means and recording the trajectory of irradiation of said beam;

a recording information storage means for storing information to be recorded on said recording member, the recording information read from said information storage means being supplied to said beam generating means as said modulating signal;

a beam detecting means provided along the path of the deflected beam on only one side of said recording member for releasing a beam detection signal upon detecting the arrival of said deflected beam at said detecting means; and

a signal forming means for selecting one of a plurality of consecutive beam detection signals released from said beam detecting means during one reciprocation of the beam for forming a reference signal for instructing the initiation of the readout from said recording information storage means.

4,351,006

METHOD OF AND APPARATUS FOR STORING DATA SIGNALS

Peter Clough, Warrington, England, and Donald C. B. Walker, deceased, late of Lymm, England (by Eileen F. Walker, Administratrix), assignors to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 6, 1980, Ser. No. 127,911

Claims priority, application United Kingdom, Mar. 19, 1979, 7909588

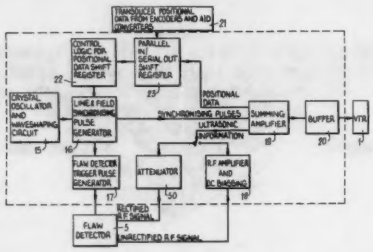
Int. Cl.³ H04N *5/79, 5/795;* G01D *5/12*

U.S. Cl. 360—9 **7 Claims**

1. A method of storing data signals from an ultrasonic transducer for subsequent reproduction, comprising receiving radio frequency data signals transmitted from the ultrasonic trans-

ducer and positional data signals from a source associated with the transducer and converting said radio frequency data signals and said positional data signals into a format in which they can be recorded on tape by a video recorder which has a head servo driven by field synchronising pulses, said converting being effected by generating modified line synchronising pulses, selecting a first group of the modified line synchronising pulses and transmitting said radio frequency data signals to the video recorder when said first group of modified line synchronising pulses occurs, and selecting a second different group of the modified line synchronising pulses interleaved wtih said first group of modified line synchronising pulses and transmitting said positional data signals to the video recorder when said second group of modified line synchronising pulses occurs, whereby said radio frequency data signals and said positional data signals are interleaved on the tape.

3. Apparatus for storing radio frequency data signals transmitted from an ultrasonic transducer and positional data signals



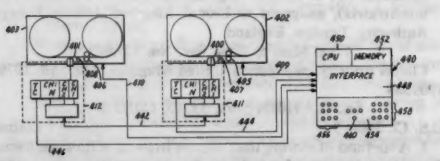
from a source associated with the transducer, the apparatus comprising a video recorder which has a head servo driven by field synchronising pulses, a first interface unit for receiving and converting said radio frequency data signals and said positional data signals into a format in which they can be recorded on tape by said video recorder; said first interface unit comprising means for generating modified line synchronising pulses, means for selecting a first group of said modified line synchronising pulses and transmitting said radio frequency data signals to the video recorder when said first group of modified line synchronising pulses occurs, and means for selecting a second different group of modified line synchronising pulses interleaved with said first group of modified line synchronising pulses and for transmitting said positional data signals to the video recorder when said second group of modified line synchronising pulses occurs, whereby said radio frequency ultrasonic data signals and said positional data signals are interleaved on the tape.

4,351,007

EDITOR FOR COMBINING DIGITALLY RECORDED AUDIO SIGNALS

Robert J. Youngquist, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 68,070, Aug. 1, 1979. This application Jan. 21, 1981, Ser. No. 226,616
Int. Cl.³ G11B *27/02*
U.S. Cl. 360—13 **16 Claims**



1. A method for editing and combining selected portions of digitally encoded audio signals recorded on at least one record medium to form a composite digitally encoded audio signal, comprising the steps of

(a) reproducing signals digitally recorded on said at least one record medium to present audible displays of audio signals recorded on said at least one medium,

(b) operating in response to said audible displays to designate tentative entry and exit edit point words defining the spatial locations of selected portions of said reproduced signals to be joined in sequence to form said composite signal,

(c) storing the tentative edit point words defining said spatial locations,

(d) presenting audible displays of selected portions of the audio signals which are proximate to said spatial locations defined by said tentative edit point words,

(e) iteratively refining said spatial locations defined by said edit point words in steps of discrete time intervals of decreasing duration by operating in response to repeated audible displays of the selected portions of the audio signals to establish increasingly refined entry and exit edit points,

(f) storing the refined edit point words, and

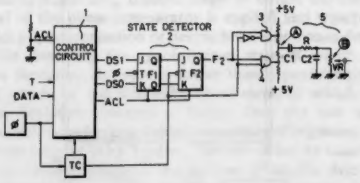
(g) switching between audio signals located on said at least one medium at spatial locations defined by said refined edit point words to sequentially join selected portions of said signals at the thus defined spatial locations to thereby form said composite digitally encoded audio signal.

4,351,008

MODULATOR FOR USE IN AN INTERFACE BETWEEN A DIGITAL SIGNAL PROCESSING APPARATUS AND AN AUDIO TAPE DECK

Daisuke Mochizuki, and Shigeru Kitano, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 24, 1980, Ser. No. 114,745
Claims priority, application Japan, Jan. 25, 1979, 54-7836
Int. Cl.³ G11B *5/09*
U.S. Cl. 360—40 **4 Claims**



1. A modulator comprising:

control means for reading data words and for producing a digital output signal synchronized to a carrier signal in response to a data transmission instruction, said control means adding a start bit and a stop bit to each of said data words when producing said digital output signal;

an output line; and

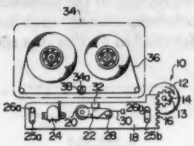
state detector means for receiving said digital output signal from said control means and for passing said carrier signal to said output line when said digital output signal is in a first state and inhibiting the passage of said carrier signal to said output line when said digital output signal is in a second state.

4,351,009

APPARATUS FOR MOVING THE PINCH ROLLER AND THE MAGNETIC HEAD OF A TAPE RECORDER

Hajime Osada; Akiteru Kimura, both of Fuchu; Tokuo Shimizu; Goro Kitajima, both of Hachioji; Yoshio Tomizawa, Tama; Makoto Kondo, Fuchu; Kazuyasu Motoyama, and Masaaki Daigaku, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed May 8, 1980, Ser. No. 147,712
Claims priority, application Japan, Jun. 19, 1979, 54-77139
Int. Cl.[3] G11B *21/02*
U.S. Cl. 360—105 4 Claims



1. An apparatus for moving a pinch roller and a tape head located in a tape recorder relative to a capstan of said tape recorder, said apparatus comprising:

(A) a capstan located in said tape recorder;

(B) a movable member carrying a pinch roller and a tape head, said member being movable between a first position wherein said pinch roller abuts said capstan and said tape head is in an operative position and a second position wherein said pinch roller is spaced from said capstan and said tape head is away from said operative position; and

(C) a drive mechanism for moving said movable member between said first and second positions, said drive mechanism including:

(1) a drive member;

(2) a driven member directly connected to said drive member and directly connected to the movable member; and

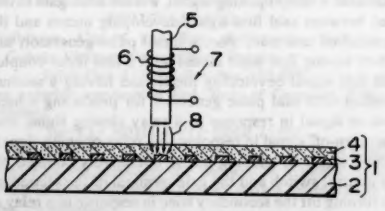
(3) a motor having an output shaft to which said drive member is directly fixed for imparting a drive force to said drive and driven members, said drive member directly driving said driven member to move said movable member between said first and second positions responsive to said driving force.

4,351,010

MAGNETIC RECORDING MEDIUM HAVING A VERTICAL AXIS OF EASY MAGNETIZATION

Yoshihiro Arai, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 14, 1980, Ser. No. 130,386
Claims priority, application Japan, Mar. 16, 1979, 54-30724
Int. Cl.[3] G11B *5/68, 23/00*
U.S. Cl. 360—131 6 Claims



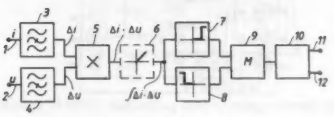
1. In a magnetic recording medium for use in vertical magnetic recording, comprising a substrate of a non-magnetic material, and a magnetic recording layer of a magnetic material provided thereon having an axis of easy magnetization vertical with respect to said magnetic recording layer, wherein the improvement comprises a magnetic flux converging element of linear shape and having a high permeability material provided between said substrate and said magnetic recording layer, said magnetic flux converging element converging a diverging magnetic flux from a magnetic head located above said magnetic recording medium, and further comprising a non-magnetic material provided in said magnetic flux converging element.

4,351,011

DIRECTIONAL WAVE DETECTOR APPARATUS

Salomon Liberman, Ra'anana, Israel, assignor to ASEA Aktiebolag, Vasteras, Sweden

Continuation of Ser. No. 26,366, Apr. 2, 1979, abandoned. This application May 1, 1981, Ser. No. 259,719
Claims priority, application Sweden, Apr. 6, 1978, 7803868
Int. Cl.[3] G01R *31/08;* H02H *3/38*
U.S. Cl. 361—82 8 Claims



1. Directional wave detector apparatus in electrical power line relay protection devices for determining the direction to a fault from the direction of movement of travelling waves generated by a fault and passing through a measuring point in said electrical power lines, comprising:

means for multiplying or dividing the current and voltage of at least a portion of the travelling waves to determine the sign of the product or quotient signal;

means for recording the sign of the first appearing product or quotient; and

means for emitting a tripping or blocking signal dependent on whether the sign of the product or quotient obtained upon multiplication or division indicates that the fault lies within or outside the range of protection of the relay, respectively.

4,351,012

CIRCUIT INTERRUPTER WITH DIGITAL TRIP UNIT AND MEANS TO ENTER TRIP SETTINGS

Robert T. Elms; Joseph C. Engel, both of Monroeville; Bernard J. Mercier, Pittsburgh; Gary F. Saletta, Irwin, and John T. Wilson, Beaver, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 15, 1980, Ser. No. 140,553
Int. Cl.[3] H02H *3/093*
U.S. Cl. 361—96 4 Claims

1. Circuit interrupter apparatus, comprising:

interrupter means for conducting current flow through an associated circuit and for operating to interrupt said current flow on command;

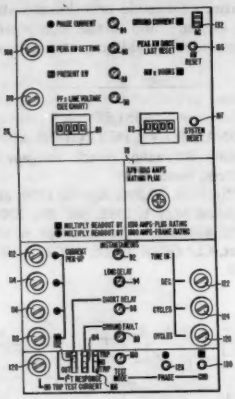
sensing means for sensing current flow through said interrupter means;

a trip unit connected to said sensing means and said actuating means for comparing current flow through said interrupter means to a time-current trip characteristic and for operating said interrupter means when current flow therethrough exceeds said time-current trip characteristic, said trip unit comprising memory means for storing a plurality of parameter values defining said time-current trip characteristic;

entry means for supplying operator-entered values of parameters defining said time-current trip characteristic to said memory means;

a housing enclosing said interrupter means, said sensing means, said trip unit, and said entry means; and

display means attached to an exterior surface of said housing means and connected to said memory means for supplying a substantially real-time numeric display of said parameter value stored in said memory means, whereby the operator



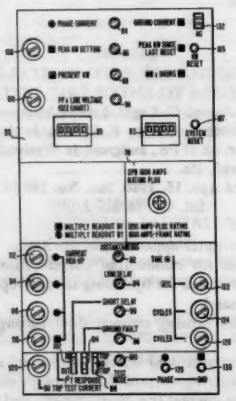
obtains confirmation that said operator-entered parameter values are the values which will be utilized by said trip unit to perform said comparison between said curret flow and said trip characteristic.

4,351,013

CIRCUIT INTERRUPTER WITH MULTIPLE DISPLAY AND PARAMETER ENTRY MEANS

Joseph J. Matsko; John A. Wafer, both of Beaver; Joseph C. Engel, Monroeville, and Bernard J. Mercier, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 15, 1980, Ser. No. 140,557
Int. Cl.³ H02H 3/093
U.S. Cl. 361—96 **13 Claims**



1. Circuit interrupter apparatus, comprising:

interrupter means for conducting current flow through an associated electrical circuit and for operating to interrupt current flow therethrough upon command;

sensing means for sensing current flow through said interrupter means;

display means for displaying numeric quantities;

a plurality of designating means for identifying a parameter;

a plurality of light-emitting indicator members positionally associated with said designating means; and

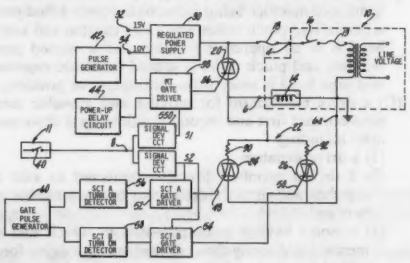
trip unit means connected between said interrupter means and said sensing means for operating said interrupter means when current flow therethrough exceeds a predetermined time-current trip characteristic defined by limit value parameters, for generating numeric quantities representing electrical parameters of an associated circuit and limit value parameters defining said time-current trip characteristic, for sequentially presenting a series of said numeric quantities to said display device, and for individually energizing said light-emitting indicator members in a sequence corresponding to the sequence of said numeric quantity presentations, whereby each numeric quantity so displayed is identified as a value of a specific parameter.

4,351,014

SOLID STATE SELF-CHECKING RELAY

George L. Schofield, Jr., Romona, Calif., assignor to Xenex Corporation, Birmingham, Mich.

Filed Jul. 18, 1980, Ser. No. 170,323
Int. Cl.³ H02H 3/00
U.S. Cl. 361—100 **17 Claims**

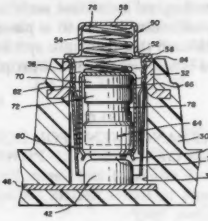


1. A relay circuit for switching an electrical load comprising a main triac having a pair of main terminals and a gate terminal, said main terminals being adapted to be connected in series with the load and an electric power source, a secondary triac having a pair of main terminals and a gate terminal, the main terminals of the secondary triac being adapted to be connected in parallel with said load, a current responsive circuit breaker connected in series with the main triac, a control circuit including a control switch for selectively producing a relay closing signal or a relay opening signal, first signal developing means operatively coupled between the control switch and the gate terminal of the main triac for turning on said main triac in response to a relay closing signal and for turning it off in response to a relay opening signal, a main triac gate driver coupled between said first signal developing means and the gate terminal of said main triac, a signal pulse generator, said gate driver having first logic means with a first input coupled with said first signal developing means and having a second input coupled with said pulse generator for producing a main triac turn-on signal in response to a relay closing signal and main triac turn-off signal in response to a relay opening signal, and a second signal developing means operatively coupled between the control switch and the gate terminal of the secondary triac for turning off the secondary triac in response to a relay closing signal and for turning the secondary triac on in response to a relay opening signal whereby the load will be deenergized by short-circuiting through the secondary triac and opening of said circuit breaker in the event that said main triac fails to turn off in response to a relay opening signal.

4,351,015
SHORTING CAGE FOR PROTECTOR WELLS

Thomas J. Smith, Bay Shore, N.Y., assignor to TII Industries, Inc., Copaigue, N.Y.

Filed Sep. 21, 1981, Ser. No. 303,835
Int. Cl.³ H02H 1/04
U.S. Cl. 361—119 9 Claims



1. An overvoltage surge arrester apparatus for protecting communication lines and equipment connected thereto from voltage surges comprising:

(a) a housing of insulating material having at least one well-type aperture disposed therein, said well-type aperture being provided with a first electrode adapted to be connected to earth ground and disposed at the closed end thereof having an upwardly extending portion and a second electrode disposed about the periphery of the open end of said well-type aperture, said second electrode being adapted to be connected to one of said communication lines;

(b) a hollow, electrically conductive shorting cage adapted to be received into said well-type aperture, said shorting cage being in continuous intimate electrical contact with said second electrode and having at least one inwardly extending finger portion adapted to be in electrically conductive contact with said upwardly extending portion of said first electrode; and

(c) a protector cartridge including an electrically conductive shell adapted to be received into said hollow shorting cage and be in electrically conductive contact at the upper portion thereof providing electrically conductive contact with a protective device disposed within said shell, one terminal of said protective device extending downwardly beyond said shell and being adapted to be in electrical contact with said upwardly extending portion of said first electrode when in position in said shorting cage, said protector cartridge shell displacing the inwardly extending finger portion of said shorting cage causing it to be out of electrically conductive contact with said upwardly extending portion of said first electrode when in position in the well-type aperture.

4,351,016
DEVICE FOR ARRESTING THE MOTION OF A MOTOR DRIVEN PANEL

Willy Felbinger, Altdorf, Fed. Rep. of Germany, assignor to Saint Gobain Vitrage, Aubervilliers, France

Filed Oct. 1, 1980, Ser. No. 192,889
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1979, 2939942
Int. Cl.³ H01H 47/12; E05F 15/02
U.S. Cl. 361—181 14 Claims

1. Apparatus for arresting the motion of a motor driven panel when an object comes in contact with a leading edge of said panel comprising:

(a) an electrical conductor along said leading edge of said panel;

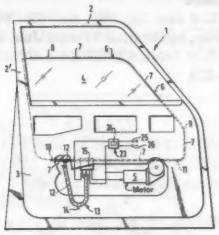
(b) means for sensing the presence of an object in contact with said electrical conductor;

(c) a switching means responsive to said sensing means for disconnecting or reversing power to said motor when an object is in contact with said conductor;

(d) a means for reversing polarity of the power supplied to said motor to reverse its direction, thus moving said panel either toward a first position or toward a second position;

(e) a conducting surface which contacts said panel when said panel is in said second position;

(f) an extension of said electrical conductor along the edge of said panel to a point where said conductor contacts said conducting surface when said panel moves to said second



position, thereby actuating said sensing circuit and removing power from said motor;

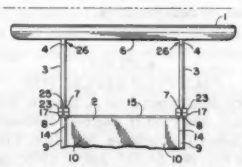
(g) means for providing power of the proper polarity to said sensing means and said switching means when power of either polarity is selected; and

(h) means for preventing said switching means from operating to disconnect power to said motor for a period of time after an application of power to said motor when said panel is in said second position, whereby said motor is actuated for a time interval sufficient to allow said panel to move from said second position.

4,351,017
AMBIENT LIGHT

Douglas C. Ball, Quebec, Canada, assignor to Hauserman Ltd., Waterloo, Canada

Filed Oct. 1, 1979, Ser. No. 80,385
Int. Cl.³ F21S 1/02
U.S. Cl. 362—147 10 Claims



1. A space dividing wall panel and lighting fixture combination comprising:

at least one planar, vertically oriented, space dividing wall panel having an upper edge portion and two vertical edge portions,

a vertical panel support member bordering, and hingedly secured to each vertical edge portion and including upper end connecting means,

an elongated lighting fixture having spaced engaging means on the underside thereof, said fixture being above and overlying at least in part said upper edge portion of said vertical panel support member, a pair of lighting fixture support means, said lighting fixture support means each including lower connecting means at the lower end thereof constructed and arranged to rigidly connect with said upper end connecting means, and, complimentary

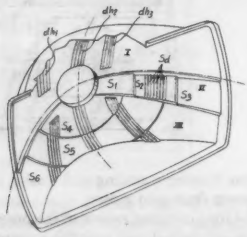
engaging means at the upper end thereof constructed and arranged to engage with one of said spaced engaging means on the underside of said elongated lighting fixture at any one of a plurality of different positions longitudinally along said elongated lighting fixture.

4,351,018

LAMP WITH STEPPED REFLECTOR SURFACE CONTAINING VERTICAL RIBS

Hector Fratty, Boulogne, France, assignor to Cibie Projecteurs, Bobigny, France

Filed Jun. 24, 1980, Ser. No. 162,503
Claims priority, application France, Jun. 29, 1979, 79 16926
Int. Cl.³ F21M *3/08*
U.S. Cl. 362—215 **12 Claims**



1. A motor vehicle headlamp, comprising:

a generally parabolic reflector having a generally concave reflecting surface, the general shape of the reflector having a focus,

a lens in front of the reflecting surface and cooperating with the reflector to define an enclosure, and

a light source within the enclosure for emitting light which is directed in a generally forward direction by the reflecting surface,

the reflecting surface of the reflector having a modified portion which is of generally parabolic shape, the focus of the modified portion being spaced from the focus of the general shape of the reflector, and

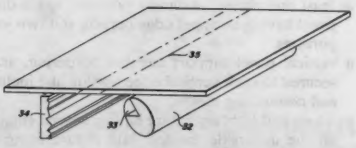
the modified portion of the reflecting surface having a generally vertical reflecting rib, the transverse cross-sectional shape of the rib being convex.

4,351,019

FACETTED REFLECTOR

Stephen T. Avery, Rochester; John A. Durbin; William L. Lama, both of Webster, and Paul H. Stelbitz, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 54,357, Jul. 2, 1979, abandoned. This application Jun. 29, 1981, Ser. No. 278,537
Int. Cl.³ F21V *7/05*
U.S. Cl. 362—298 **1 Claim**



1. An illumination system for illuminating a scan strip on an object surface, including:

a linear light source disposed adjacent to and on one side of said scan strip said light source having an aperture defined through a portion thereof,

a reflector located on the opposite side of said scan strip with its reflective surface facing said light source aperture,

said light source providing two components of light to said scan strip, one component being directly transmitted through said aperture to said scan strip and the second component being reflected from said reflector to said scan strip,

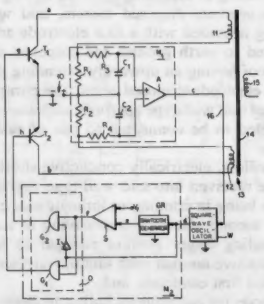
said reflector comprising a plurality of plane mirror facets, each facet having an individual surface length and disposed at an individual angle to a plane normal to said object surface such that the entire aperture of said illumination source is visible at said scan strip.

4,351,020

CIRCUIT ARRANGEMENT FOR EQUALIZING WAVEFORMS OF PUSH-PULL POWER SUPPLY

Andrea Leti, Sesto S. Giovanni, and Enrico Valacca, Pavia, both of Italy, assignors to Italtel Societa Italiana Telecomunicazioni S.p.A., Milan, Italy

Filed Mar. 26, 1981, Ser. No. 247,643
Claims priority, application Italy, Mar. 28, 1980, 20996 A/80
Int. Cl.³ H02P *13/20*
U.S. Cl. 363—26 **7 Claims**



1. A circuit arrangement for generating two alternating sets of load-energizing pulses of equal power, comprising:

two substantially identical transistors each having two main electrodes and a control electrode, one main electrode of each transistor being connected to a first terminal of a source of direct current having a second terminal connected by way of respective circuit branches to the other main electrode of each transistor, each of said circuit branches including a primary winding forming part of transformer means provided with at least one secondary winding for energizing a load;

pulse-generating circuitry with a pair of output leads connected to the control electrodes of said transistors for respectively delivering thereto two interleaved trains of first and second driving pulses of substantially constant recurrence frequency and of a width less than a half-cycle of said recurrence frequency whereby said transistors alternately conduct and energize said primary windings fractions of respective half-cycles;

sensing means for producing a pair of measuring variables respectively proportional to the mean current flow through said primary windings, said sensing means including two capacitors each connected in series with a respective resistor across at least part of one of said circuit branches; and

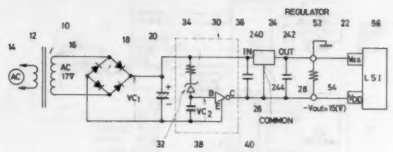
comparison means with inputs connected to said capacitors for emitting on error signal representative in sign and magnitude to any difference between said measuring variables, said pulse-generating circuitry having a control input connected to said comparison means for varying the relative width of said first and second driving pulses in a

sense tending to reduce said error signal to substantially zero, said pulse-generating circuitry including a square-wave oscillator having a control input connected to said comparison means for producing an unsymmetrical waveform in response to said error signal.

4,351,021
POWER SUPPLY/AUTO-CLEAR CIRCUIT

Mitsuo Morihisa, Nara, and Tadao Inoue, Kawachinagano, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 18, 1981, Ser. No. 235,633
Claims priority, application Japan, Feb. 18, 1980, 55-19522
Int. Cl.³ H02M *7/02*
U.S. Cl. 363—49 **8 Claims**

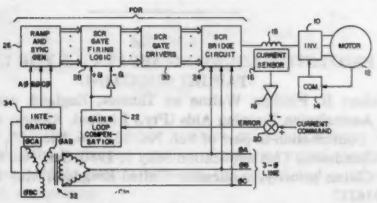


1. A power supply circuit comprising:
rectifying means for converting an alternating voltage to a DC voltage;
output terminal means for providing the DC voltage to a load;
switching means for selectively connecting said output terminal means to said rectifying means; and
control means for actuating said switching means when the DC voltage derived from said rectifying means reaches a preselected level after application of said alternating voltage to said rectifying means.

4,351,022
COMBINATIONAL LOGIC FOR GENERATING GATE DRIVE SIGNALS FOR PHASE CONTROL RECTIFIERS

Alan M. Lovelace, Administrator of the National Aeronautics and space Administration, with respect to an invention of; Carlisle R. Dolland, Torrance, and Daniel W. Trimble, La Habra, both of Calif.

Filed Jun. 30, 1981, Ser. No. 280,154
Int. Cl.³ H02P *13/26*
U.S. Cl. 363—87 **12 Claims**

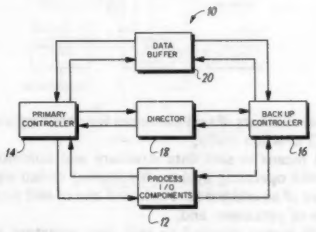


1. In a phase-delay rectifier (PDR) having a silicon controlled rectifier (SCR) bridge circuit to transfer 3-phase line power to a dc link, wherein actual current in said link is compared with a current command for generating a firing angle control signal, α, applied to the PDR to produce a firing angle in a range from 0° to 180°, wherein the output voltage of the PDR is proportional to the cosine of the firing angle, and a cosine ramp signal for a given SCR relating to a given phase is used to generate the gate firing pulse for the SCR by comparing the difference signal, α-control, to said cosine ramp to determine the correct time for firing each SCR, an improvement comprising means responsive to said control signal, cosine ramp signals and phase signals of said 3-phase line power transformed into 90° phase delayed line neutral phase signals $A\phi$, $B\phi$ and $C\phi$ for producing firing control signals, for SCR switches in said bridge circuit, said means comprising
means for comparing said phase signals $A\phi$, $B\phi$ and $C\phi$ with each other in pairs for producing squarewave signals $+A\phi$ SYNC, $+B\phi$ SYNC and $+C\phi$ SYNC indicative of the 120° phase relationship of the separate lines of said 3-phase power,
means for generating said cosine ramp signals,
comparator means for comparing said α-control signal with each of said cosine ramp signals for generating a square-wave COMP signal from each of said cosine ramp signals that is high when said cosine ramp signals exceed said α-control signal, and
combinational logic responsive to said COMP signals and said SYNC signals for producing said SCR firing control signals.

4,351,023
PROCESS CONTROL SYSTEM WITH IMPROVED SYSTEM SECURITY FEATURES

Donald K. Richer, Mansfield, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Apr. 11, 1980, Ser. No. 139,495
Int. Cl.³ G06F *15/46, 11/16*
U.S. Cl. 364—187 **10 Claims**



6. A method of providing enhanced control security within an industrial process control system comprising the steps of:
selecting one of at least two controllers to be on control and the other to be on backup;
providing a periodic transfer of the data base of said one controller into a separate buffer memory that is serially connected between said controllers such that each shares access to said buffer memory so as to isolate individual data storage means in each of said controllers;
transferring said data base from said buffer memory to data storage means within the other controller within the interim between said periodic transfer, whereby said other controller is given a delayed copy of said data base;
tracking said one controller with said other controller while said other controller is on backup; and
initiating a switchover of control to said other controller in the event of failure of said one controller.

4,351,024
SWITCH SYSTEM BASE MECHANISM

John J. Bradley, Garches, France, and Benjamin S. Franklin, Cambridge, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

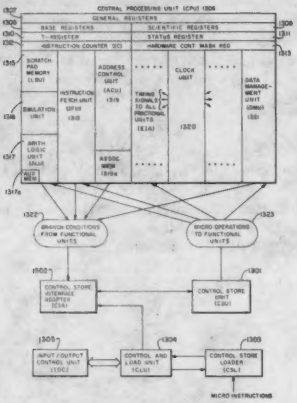
Filed Apr. 21, 1975, Ser. No. 570,331
Int. Cl.³ G06F *9/18*
U.S. Cl. 364—200 **6 Claims**

1. In a multiprogramming computer system having a main memory, a central processing unit (CPU) coupled to said main memory, said (CPU) controlling the state of a plurality of groups of processes being in a running, ready, wait or suspended state, said computer system also having scratchpad

registers being accessible to an operating system for controlling said multiprogramming computer system, a data structure for storing coded signals for communicating between said processes and said operating system, and said scratchpad registers, said data structure comprising:

(a) first means in said data structure and communicating with said operating system for storing coded signals indictive of an address for a selected one of said processes;

(b) second means in said first means for storing coded signals indicating priority of said selected one of said processes in



relation to others of said processes for obtaining control of said CPU when ready;

(c) third means in said data structure and communicating with said operating system, for storing coded signals indicative of an address for a selected one of said plurality of groups of processes, and,

(d) fourth means coupled to said data structure and said scratchpad registers, for generating signals causing the changing of information in said data structure and said scratchpad registers.

4,351,025

PARALLEL DIGITAL COMPUTER ARCHITECTURE

William B. Hall, Jr., 3817 Reinwood Dr., Dayton, Ohio 45414

Continuation of Ser. No. 55,424, Jul. 6, 1979, abandoned. This application Sep. 21, 1981, Ser. No. 304,125

Int. Cl.³ G06F *9/16*

U.S. Cl. 364—200 **12 Claims**

1. A digital data processing apparatus for executing real-time analog format functions comprising:

(a) a plurality of elemental computers, each of which is a complete digital data processor having its own central processing unit, memory, input/output means, cycle clock, external interrupt capacity, and stored program;

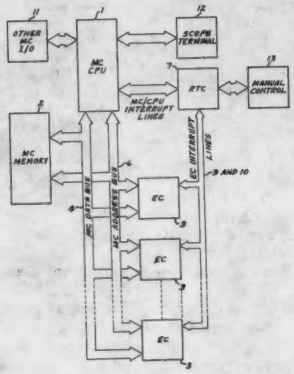
(b) a master controller with a master cycle clock and an external interrupt capacity for regulating the transfer of data between elemental computers in conformity to an ordered sequence;

(c) an MC memory;

(d) master bus means comprising a data bus and an address bus, both coupled to the master controller, to the MC memory, and to the input/output means of the elemental computers;

(e) a real-time clock operating at a rate commensurate with the upper frequencies of a simulation but at a substantially lower frequency than said cycle clocks, an MC interrupt line coupling said real-time clock to the master controller, and two MC interrupt lines which are an integrator interrupt line and a non-integrator interrupt line, with each elemental computer coupled to said real-time clock via at least one of said two EC interrupt lines; wherein said real-time clock generates timing comprising repetitive frames with alternating EC time slots and MC time slots in each frame, the EC time slots being divided into a plurality of non-integration time slots and one integration time slot each frame, the number of EC time slots per frame being determined by the maximum number of interchanges of data required by the program for non-integrating functions between integrating functions;

(f) wherein for any given simulation program some of the elemental computers are assigned non-integrating functions and are enabled via said non-integrator interrupt line during non-integration time slots, and other of the elemental computers are assigned integrating functions and are enabled via said integration interrupt line during integration time slots,



each said function corresponding to the function of one computing element of an analog computer, each elemental computer making one pass of its program to perform its assigned function digitally upon receiving an interrupt signal;

(g) the master controller being enabled via said MC interrupt line during MC time slots to transfer data via said master bus means among the elemental computers, so as to be means functionally equivalent to patchcord interconnections of computing elements of an analog computer; and

(h) wherein said input/output means comprises registers addressable from either the master controller via said master bus means or from the respective elemental computers.

4,351,026

PROJECTILE LOCATING APPARATUS FOR USE IN TARGET SHOOTING

Robert B. Phillips, Walton on Thames, England, assignor to Australasian Training Aids (Pty.) Limited, Albury, Australia

Continuation-in-part of Ser. No. 131,086, Mar. 17, 1980, abandoned. This application May 9, 1980, Ser. No. 148,570

Claims priority, application United Kingdom, May 10, 1979, 7916217

Int. Cl.³ F41J *5/12*; G06F *15/20*

U.S. Cl. 364—423 **59 Claims**

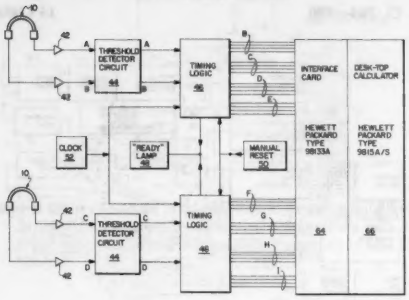
25. Apparatus for determining the location of a point on a reference plane through which the trajectory of a supersonic projectile passes, comprising:

first and second vibration transmitting means located at respective spaced locations, each said virbration transmitting means having a surface defining an arc in the plane and having two ends, and each said vibration transmitting means transmitting vibrations caused by an airborne shock or pressure wave of the supersonic projectile to the two ends thereof;

first and second signal producing means operatively coupled to the respective ends of said first vibration transmitting means and third and fourth signal producing means opera-

tively coupled to the respective ends of said second vibration transmitting means, said first, second, third and fourth signal producing means generating respective output signals in response to the transmitted vibrations;

timing circuit means responsive to said output signals for producing a first signal representing a time difference between the output signals of the first and second signal



producing means and a second signal representing a time difference between the output signals of the third and fourth signal producing means; and

computing means operative to calculate the location of said point on the reference plane through which the trajectory of the supersonic projectile passes, from the first and second time difference signals and from the locations of said first and second transmitting means.

4,351,027

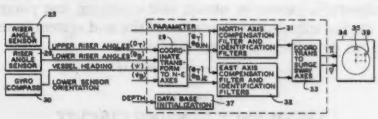
ADAPTIVE RISER ANGLE POSITION REFERENCE SYSTEM

Tom A. Gay, Houston, Tex.; Gary L. Hartman, Fridley, and Gunter Stein, New Brighton, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 13, 1980, Ser. No. 177,667

Int. Cl.³ G06F *15/20;* **B63H** *15/00*

U.S. Cl. 364—432 **15 Claims**



1. An adaptive riser angle position reference system for determining the horizontal position of a marine vessel supporting a riser which extends between the vessel and a subsea wellhead, comprising:

a first vertical angle sensor for producing a lower angle signal indicative of deviation from vertical of the lower riser at a point proximate the wellhead;

a second vertical angle sensor for producing an upper angle signal indicative of deviation from vertical of the upper riser at a point proximate the marine vessel;

compensation filter means having filter characteristics which are variable in accordance with filter coefficients supplied thereto;

riser parameter identification means connected to receive the lower and upper angle signals and operable to determine a riser model whose response approximates that of the riser and to supply corresponding filter coefficients to said compensation filter means;

first transfer means for receiving the lower and upper angle signals and supplying corresponding signals to said compensation filter means, whereby the output of said compensation filter means is indicative of vessel position;

utilization means; and

second transfer means for receiving the output of said compensation filter means and supplying corresponding position information to said utilization means, whereby said utilization means is operable to indicate horizontal vessel position relative to the wellhead.

4,351,028

METERS FOR MEASURING ELECTRICAL ENERGY CONSUMPTION

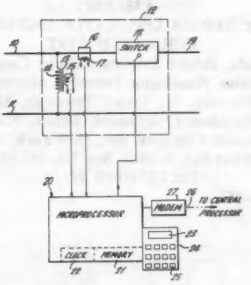
Robert A. Peddie, Reigate, and John S. Fielden, Ottery St. Mary, both of England, assignors to South Eastern Electricity Board, England

Filed Feb. 19, 1980, Ser. No. 122,166

Claims priority, application United Kingdom, Feb. 21, 1979, 7906212

Int. Cl.³ G01R *11/63;* **G06F** *15/20*

U.S. Cl. 364—483 **15 Claims**



1. A meter for measuring electrical power consumption by a load circuit of a consumer comprising sensing means for sensing the voltage applied to that circuit and the current flowing in the circuit, digital data processing means responsive to the sensed voltage and current from said sensing means and including a programmable memory and operative to compute from the values of the sensed voltage and current and from data in the programmable memory, the charges in monetary units for energy consumed, means for periodically including in the computed charges a time-dependent component, and means for indicating the total accumulated credit or debit information in monetary terms.

4,351,029

TOOL LIFE MONITORING AND TRACKING APPARATUS

Robert E. L. Maxey, North Huntington, and James N. Brecker, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 5, 1979, Ser. No. 100,674

Int. Cl.³ G06F *15/46;* **G01N** *19/02*

U.S. Cl. 364—511 **7 Claims**

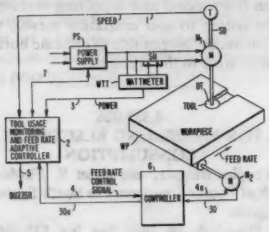
1. A system for monitoring tool life on a machine tool having at least one operative tool thereon, comprising:

means for instantaneously and recurrently deriving a measuring signal characteristic of power consumed by said machine tool for the purpose of relative motion between said workpiece and said tool;

said measuring signal deriving means being operable in one of an idle position mode and a working position mode of said tool relative to said workpiece;

means for combining an idle position measuring signal and a working position measuring signal for deriving a signal indicative of net power consumed by said tool;

means for integrating said indicative signal as a function of time for obtaining a past history characteristic signal;



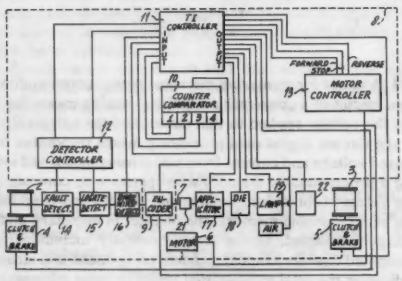
means responsive to said integrating means for comparing said characteristic signal with a reference signal representative of the life expectancy of said tool.

4,351,030

AUTOMATIC REPAIR APPARATUS AND METHOD FOR INSULATED WIRE

Gregory Astfalk, Bristol Township, Bucks County, Pa.; Lawrence A. Fowler, Washington Township, Mercer County, N.J.; Chauncey Herring, Jr., Ewing Township, Mercer County, N.J., and Thaddeus J. Szymczak, Edison, N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Sep. 8, 1980, Ser. No. 185,067
Int. Cl.³ G01R *31/14*
U.S. Cl. 364—552 **16 Claims**



1. A machine for detecting and repairing faults in the insulation of insulated wire comprises:

a wire supply reel and a wire take-up reel spaced therefrom;

means for conveying the wire through the machine from the supply reel to the take-up reel;

a first fault detector through which the wire passes for sensing the presence of a fault;

a second fault detector, spaced from the first fault detector for specifically locating a detected fault in the insulation;

a sequence of spaced fault repair means serially activated after location of the fault and located at fixed distances from the second fault detector said repair means including means for applying a curable repair coating over the fault and means for curing the coating;

control means responsive to the detection of a fault for causing the wire to stop and controlling the direction and speed of movement of the wire as it progresses through the machine; and

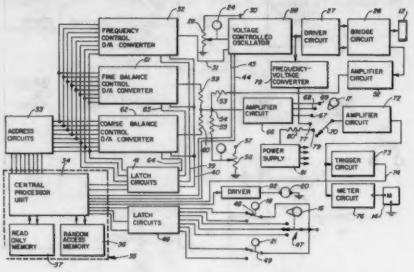
process control means for automatically activating and deactivating the control means and the respective sequential repair means at predetermined distances of movement from the second fault detector of the insulated wire to be repaired.

4,351,031

NONDESTRUCTIVE TESTING SYSTEM HAVING AUTOMATIC SET-UP MEANS

John J. Flaherty, Elk Grove Village; Eric J. Strauts, Park Ridge; Helmut F. Wagerer, Des Plaines, and Timothy C. Loose, Chicago, all of Ill., assignors to Magnaflux Corporation, Chicago, Ill.

Filed Nov. 7, 1980, Ser. No. 204,946
Int. Cl.³ G01R *33/00*
U.S. Cl. 364—580 **14 Claims**



1. In a nondestructive testing system including measuring means for developing an output signal corresponding to characteristics of a structure under test, said measuring means including adjustable means for controlling the value of a test parameter over a certain range, and set-up means for adjusting said adjustable means, said set-up means comprising: memory means for storage of the value of said output signal and the concurrent value of said test parameter, program means for control of said adjustable means and said memory means, said program means being operable under each of a plurality of different set-up test conditions for adjusting the value of said test parameter over said certain range and for simultaneously storing a set of output signal values and concurrent test parameter values, and comparison means associated with said memory means for comparing said sets of stored output signal and test parameter values and for developing and storing an optimum parameter value at which a predetermined correspondence between output signals is obtained during said plurality of different set-up test conditions, and means operative upon storage of said optimum parameter value for then adjusting said adjustable means to obtain said optimum test parameter value during subsequent operation of the said system in testing structures of unknown characteristics.

4,351,032

FREQUENCY SENSING CIRCUIT

Richard F. Challen, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Continuation-in-part of Ser. No. 965,897, Dec. 4, 1978, abandoned. This application Jun. 20, 1980, Ser. No. 161,563
Int. Cl.³ G06F *7/38*
U.S. Cl. 364—724 **49 Claims**

1. A frequency sensing circuit comprising:

means for sampling an input signal;

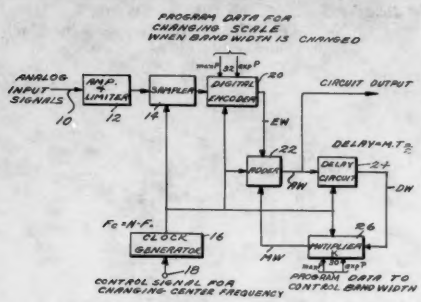
means coupled to said means for sampling, for encoding each sample as a digital signal at an output thereof;

an adder having a first input coupled to the output of said means for encoding and having a second input and an output;

delay means having an input coupled to the output of said adder for delaying signals applied thereto by an amount that is approximately an integral multiple of one-half the time period of the frequency to be sensed, said delayed signals being provided at an output;

a multiplier having an input coupled to the output of said delay means and having an output coupled to said second input of said adder;

means for clocking said multiplier at a rate of two or more times the desired frequency to be sensed; and



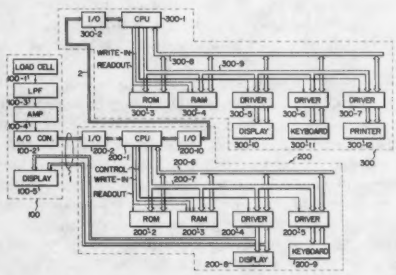
means coupled to said frequency sensing circuit for deriving an output signal therefrom having a magnitude indicative of the presence of the frequency to be sensed in said input signal.

4,351,033

POSTAL CHARGE PROCESSING SYSTEM WHEREIN POSTAL CONDITION DATA IS SAVED AND REUSED FOR THE NEXT POSTAL PARCEL

Mitsuo Uchimura, Numazu; Masao Oana, and Yoshiharu Nishimura, both of Mishima, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1980, Ser. No. 124,603
Claims priority, application Japan, Mar. 7, 1979, 54-26463
Int. Cl.³ G06F *15/20*; G01G *19/04*
U.S. Cl. 364—900 **4 Claims**



1. A postal charge processing system comprising:

weight measuring means for measuring the weight of a postal item and producing weight data corresponding to the measured weight of said postal item;

first switching means for selectively setting postal conditions including the way of mail and region of destination;

first memory means for storing postal condition data produced in accordance with the operation of said first switching means;

second memory means;

second switching means;

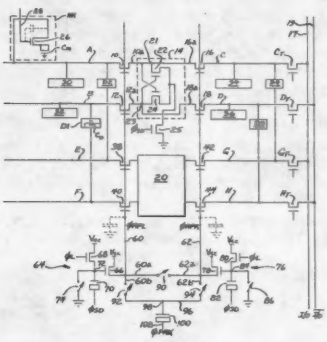
data processing means coupled to said first and second switching means and also to said first and second memory means for calculating the postal charge based on the contents stored in said first and second memory means and weight data supplied from said weight measuring means, said data processing means including means for causing the data in said first memory means to be written into said second memory means and then cleared when detecting that weight data indicating 0 grams is supplied from said measuring means and including means for detecting operation of said first and second switching means for causing the data in said second memory means to be written into said first memory means when detecting that said second switching means is operated before said first switching means is operated.

4,351,034

FOLDED BIT LINE-SHARED SENSE AMPLIFIERS

Sargent S. Eaton, Jr., and David R. Wooten, both of Colorado Springs, Colo., assignors to Inmos Corporation, Colorado Springs, Colo.

Filed Oct. 10, 1980, Ser. No. 195,728
Int. Cl.³ C11C *13/00*
U.S. Cl. 365—189 **10 Claims**



1. In an MOS memory having a plurality of memory cells each having a memory cell capacitor adapted to be charged so as to reflect the logic state of its memory cell, having a plurality of bit lines with associated isolation transistors and word lines for accessing a particular memory cell, and having a plurality of input/output buss lines for reading the logic state of the accessed memory cell, a folded bit line-shared sense amplifier arrangement for sensing the state of an accessed memory cell, comprising:

a shared sense amplifier positioned between and coupled to first and second bit lines via first and second isolation transistors and positioned between and coupled to third and fourth bit lines via third and fourth isolation transistors, said first and said third bit lines being adjacent each other and said second and said fourth bit lines being adjacent each other;

decoding means for selectively activating said first and third isolation transistors to couple said first and third bit lines to said shared sense amplifier; and

means for enabling said shared sense amplifier to latch in a state indicative of the difference in voltage between said first bit line and said third bit line, said difference representing the logic state of the accessed memory cell,

said decoding means selectively conditioning said second and fourth isolation transistors to couple said latched state of said shared sense amplifier to the input/output buss lines via said second and fourth bit lines so as to read the voltage state of the accessed memory cell;

4,351,035

METHOD OF AND APPARATUS FOR LOCATING DISTURBANCES IN A MINERAL SEAM

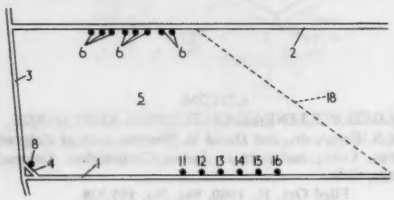
David J. Buchanan, Burton-on-Trent, and Iain M. Mason, Oxford, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Oct. 19, 1979, Ser. No. 86,628

Claims priority, application United Kingdom, Oct. 20, 1978, 41420/78

Int. Cl.[3] G01V *1/00*

U.S. Cl. 367—14 20 Claims



20. Apparatus for locating disturbances in a mineral seam comprising a source of seismic waves, an array of detectors for detecting the waves and processing electrical signals generated by the detectors when waves are detected, the processing means including means for recompressing the signals and further means arranged to produce a holograph of the seam from the recompressed signals.

4,351,036

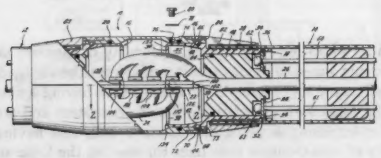
SUBMARINE CABLE CONNECTOR LINK

John C. Mollere, Nassau Bay, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Continuation-in-part of Ser. No. 69,208, Aug. 23, 1979, Pat. No. 4,260,211. This application Sep. 25, 1980, Ser. No. 190,674

Int. Cl.[3] H01R *13/62*

U.S. Cl. 367—20 5 Claims



1. A hermaphroditic submarine cable connector link for coupling together a pair of adjacent elongated seismic streamer cable sections, the sections including at least one stress member, a plurality of hydrophones, a plurality of wires for transmitting hydrophone signals and an outer jacket, comprising:

identical end fittings fastened to the ends of the pair of adjacent cable sections for receiving the plurality of wires;

identical connector plates at the ends of the adjacent cable sections for mounting a plurality of multicontact connector plugs to which said plurality of wires are connected;

means for mating the connector plates of the pair of adjacent cable sections;

means for linking the mated connector plates to the end fittings of said adjacent cable sections;

an outer barrel for engaging and rigidly locking together the end fittings of said adjacent cable sections;

an internal lip around an internal circumference of an exposed portion of said end fittings;

a pair of diametrically opposed slots in said lip; and

a pair of notches near each end of the mated connector plates for engaging the lips of said end fittings after insertion of said mated connector plates through said slots.

4,351,037

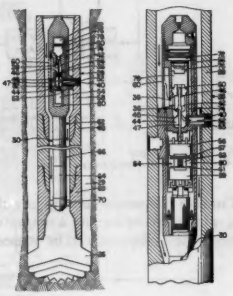
SYSTEMS, APPARATUS AND METHODS FOR MEASURING WHILE DRILLING

Serge A. Scherbatskoy, P.O. Box 1936, Fort Worth, Tex. 76101

Division of Ser. No. 857,677, Dec. 5, 1977. This application Jan. 10, 1980, Ser. No. 110,848

Int. Cl.[3] G01V *1/40, 1/02*

U.S. Cl. 367—85 29 Claims



1. For use in a system for conducting drilling operations employing a string of drill pipe extending from the earth's surface having a drilling means at the lower end, a pump by which drilling fluid is forced downwardly through the drill string interior and drilling means to flow back to the surface through the well annulus, the drilling means imposing a restriction to the drilling fluid flow forming a high pressure zone in the interior of the drill string and a low pressure zone in the well annulus, a telemetering system comprising a drilling fluid bypass above the drilling means providing fluid communication between the interior of the drill string and the well annulus, the bypass having an inlet portion within said drill string and being defined in part by a valve seat having an inlet and outlet, a valve stem moveable to and away from the inlet end of said valve seat and in a linear path within said drill string forming a valve in said bypass, the bypass having an outlet portion extending from the outlet end of said valve seat to said annulus, a means for detecting the magnitude of a downhole parameter and for producing an electrical signal comprising a succession of electrical pulses which are arranged in a sequence having a time distribution representing said magnitude, an electrical energy source, means responsive to each said electrical pulse for supplying a relatively large amount of electrical power to initiate opening said valve, and substantially less power when the valve is open or closed, to generate pressure pulses in the drilling fluid, and means at the earth's surface to detect such pressure pulses and to provide a measure of the magnitude of said parameter.

4,351,038

ULTRASONIC EXAMINATION AND IMAGING

Pierre Alais, Dampierre, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Dampierre, France

Filed Dec. 30, 1980, Ser. No. 221,421

Claims priority, application France, Dec. 31, 1979, 79 32097

Int. Cl.[3] G01S *15/89*

U.S. Cl. 367—105 15 Claims

1. A device for ultrasonic imaging, comprising:

n elementary transducers distributed at equal intervals along a predetermined line,

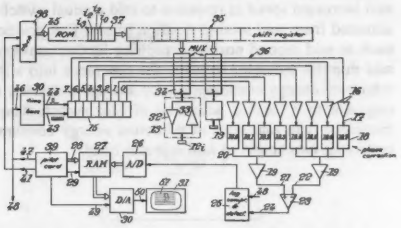
a generator of electrical pulses,

time delay means operatively associated with said generator for delivering, in response to each electrical pulse from said generator, a plurality a of a low level control pulses

delayed by different fixed time delays on different channels, a being an integer,

means for storing a distribution of said a time delays between said n transducers corresponding to focusing of transmitted ultrasonic energy at a point located at a predetermined distance from said line,

a plurality of amplifiers each associated with an individual one of said transducers for delivering an energizing pulse to the associated transducer in response to one of said low level pulses appearing on an associated channel selected by said storing means,



a plurality of analog multiplexers each associated with a corresponding one of said amplifiers,

and a bus operatively associated with said time delay means and having a plurality a of individual lines each arranged to receive a different one of said low level pulses and to control at least one said amplifier connected thereto through means of the associated multiplexer, the said associated multiplexer being controlled in turn by switching means for achieving said distribution.

4,351,039

TIMEPIECE WITH A DETECTOR AND CONTROL CIRCUIT FOR A STEPPING MOTOR

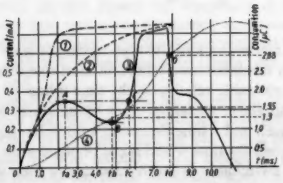
Jean-Claude Berney, Chemin du Bois de Menton, 1066 Epalinges, Switzerland, assignor to Jean-Claude Berney, Epalinges, Switzerland

Filed Sep. 8, 1980, Ser. No. 184,870

Claims priority, application Switzerland, Sep. 10, 1979, 137/79

Int. Cl.³ G04B *19/00;* **C04C** *19/00*

U.S. Cl. 368—76 **14 Claims**



1. Timepiece comprising a frequency divider, a former of driving pulses, a stepping motor, detector means of the current of said motor and a power source, said timepiece further comprising an amplifier including at least a MOS transistor receiving on a first terminal a voltage representative of the current in the driving coil of said motor, a second terminal of said transistor being joined up to a condenser connected to one of the poles of said power source, means for charging said condenser, and means for discharging said condenser, said amplifier delivering signals representative of the current in said condenser and, means for controlling the driving pulses, said driving pulses controlling means being connected to said amplifier and to said former of driving pulses.

4,351,040

QUARTZ CRYSTAL WRISTWATCH

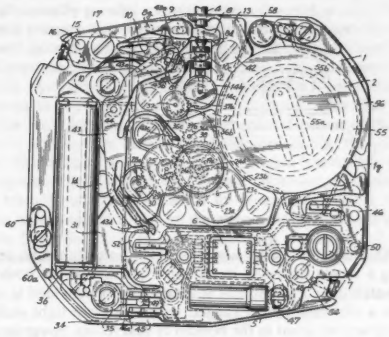
Shigeru Aoki, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 15, 1980, Ser. No. 150,262

Claims priority, application Japan, May 16, 1979, 54-59949

Int. Cl.³ G04C *23/02;* **G04B** *19/02*

U.S. Cl. 368—88 **21 Claims**



1. An analog display quartz crystal wristwatch comprising:

a quartz crystal time standard oscillator means for providing a high frequency time standard signal;

circuit means including a driving circuit for providing a low frequency time standard signal in response to said time standard signal oscillator means;

driving motor means including a driving coil and a stepping motor driven in response to said low frequency time standard signal applied by said driving circuit;

battery power means coupled to said oscillator means, circuit means and driving coil for energizing these elements;

a main movement support plate;

time display gear train means operatively coupled to said stepping motor for displaying time in analog fashion;

a winding stem selectively operably engagable with said time display gear train means for adjusting said time display gear train means;

a center wheel bridge spaced apart from and mounted on said support plate; and

a pillar-shaped center wheel shaft having a tubular region and a perpendicular disc-shaped region with a central opening, said pillar-shaped center wheel shaft mounted to said center wheel bridge for supporting a cannon pinion about the tubular region, said cannon pinion penetrating the support plate;

said time display gear train means including a center wheel having a center wheel gear and a center wheel pinion disposed between said support plate and said center wheel bridge;

an hour wheel disposed on the opposite side of said support plate as said center wheel;

said support plate having a minute wheel opening;

a minute wheel in said minute wheel opening and having a minute wheel gear engaged with said center wheel pinion, a minute wheel pinion engaged with said hour wheel and a connecting member therebetween, said minute wheel pinion being smaller than said minute wheel opening and said minute wheel gear being larger than said minute wheel opening, said connection member secured in said minute wheel opening.

4,351,041

ACOUSTIC ALARM DEVICE FOR WATCHES

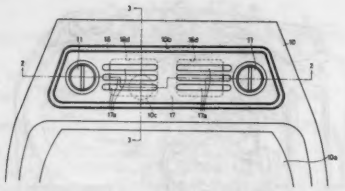
Satoru Fukutome; Hideo Hatanaka, and Motoyuki Saito, all of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1980, Ser. No. 164,769

Claims priority, application Japan, Jun. 30, 1979, 54-89820[U]; Jun. 30, 1979, 54-89821[U]; Jun. 30, 1979, 54-89822[U]

Int. Cl.³ G04C *23/02, 21/16*

U.S. Cl. 368—88 **11 Claims**



1. An alarm device for a watch having a watch case, comprising a recess provided in an upper portion of the body of said watch case, a watertight sealing member provided in said recess, a vibration plate engaged with said watertight sealing member and adjacent to the bottom of said recess, cover means for said vibration plate, said cover means having at least one sound emanating opening, and means for securing said vibration plate and said cover means to said recess, whereby the entirety of said alarm device is embedded in said recess, said securing means being a screw provided with a watertight sealing means therefor and said cover means comprising a frame member which is secured to said recess by said screw, together with said vibration plate, and a cover which is secured to said frame member by frictional engagement.

4,351,042

TIMEPIECE INCLUDING A STORAGE ARRANGEMENT

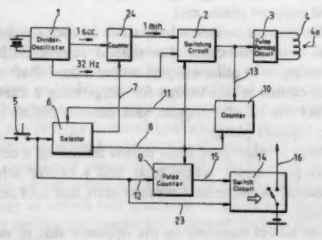
Pierre Ginalski, St-Maurice, and Pierre-Luc Gagnebin, Bienne, both of Switzerland, assignors to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Oct. 28, 1980, Ser. No. 201,673

Claims priority, application France, Nov. 5, 1979, 79 27619

Int. Cl.³ G04C *9/00*

U.S. Cl. 368—188 **7 Claims**



1. Electronic timepiece comprising:

a time-base means including an oscillator and a frequency divider for providing time-keeping pulses;

a time-display means including at least an hour indicator and a minute indicator actuated by a stepping motor;

a manually actuable electric switch movable between first and second positions;

a pulse transmission-and-modification means coupled between said time-base means and said time-display means, and connected to said manual switch, for normally applying time-keeping pulses, at a time-keeping frequency, to said time-display means with said manual switch in said first position, but: in response to said manual switch being moved briefly from said first position to said second position, applying a pulse signal to said time-display means for advancing the minute indicator through a step of one minute; in response to said switch being moved from said first position to said second position and held there for a longer duration, applying pulses at a higher frequency to said time-display means to advance the minutes hand through an increment of one hour at an increased speed; and while said minute indicator is moving at said increased speed in response to said manual switch being actuated from said second position to said first position and back to said second position, stopping further movement of said minutes indicator to place the timepiece into a state of minimum energy consumption for storage purposes; and in response to a further actuation of said switch when said timepiece is in said state of minimum energy consumption, restarting movement of said minutes hand.

4,351,043

TIME DETECTING SWITCH FOR AN ALARM CLOCK

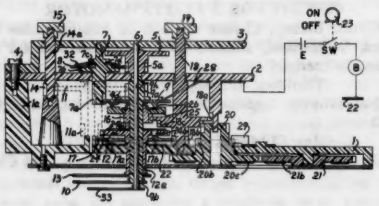
Masuo Ogihara; Kozo Chimura, and Nobuo Shinozaki, all of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Continuation of Ser. No. 908,560, May 22, 1978, abandoned. This application Oct. 14, 1980, Ser. No. 196,292

Claims priority, application Japan, May 26, 1977, 52-67946[U]

Int. Cl.³ G04C *21/16*

U.S. Cl. 368—252 **5 Claims**



1. In an alarm clock of the type having at least one rotationally driven rotatable time wheel, at least one rotatable detecting wheel rotatable relative to the time wheel to phases corresponding to alarm signaling times by an alarm signaling time setting wheel, and a time detecting switch having one switching state when the time wheel is out of phase with the detecting wheel and switchable to another switching state when the time wheel rotates into phase with the detecting wheel to thereby enable the sounding of an alarm at preselected alarm signaling times, the improvement wherein said time detecting switch comprises a slide switch comprising one of said time wheel and detecting wheel being comprised of a one-piece structure composed of electrically conductive material and having a gear teeth portion for meshing with another gear to effect rotational driving of the time wheel and further having a first set of projections which define the contact points of the slide switch, and the other of said time wheel and detecting wheel being at least partly composed of electrically insulating material and having a switch plate connected thereto having a contact portion for making sliding electrical contact with the first set of projections.

4,351,044
RECORDING SYSTEM USING DISK-SHAPED RECORDING MEDIUM

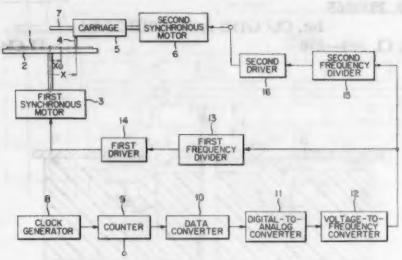
Ryoichi Imanaka, and Seizou Tsuji, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 4, 1980, Ser. No. 109,493

Claims priority, application Japan, Jan. 9, 1979, 54-1202; Oct. 23, 1979, 54-137481

Int. Cl.³ G11B *17/00*

U.S. Cl. 369—43 **3 Claims**



1. A recording system of the type in which a disk-shaped recording medium is rotated by a first driver means at an angular speed corresponding to the frequency of a first drive signal applied thereto, and inscribed with a helical recording path bearing the signal by means of a recording head which is gradually displaced in the radial direction by a second driver means, comprising:

a frequency generating means for producing output pulses at a normally constant frequency;

a counter means for starting counting of the output pulses from said frequency generating means from the time when said recording head has started the recording of a signal on said recording medium, and for generating a digital output representative of the result of the counting;

a data converter for processing the output from said counter means to generate a digital signal in a predetermined format;

a digital-to-analog converter for converting the digital output from said data converter into a DC voltage;

a voltage-to-frequency converter for generating an AC signal having a frequency corresponding to the output from said digital-to-analog converter;

first frequency divider means for frequency dividing the output from said voltage-to-frequency converter to provide a first drive signal, and for delivering said first drive signal to said first driver means to rotate said recording medium; and

second frequency divider means for frequency dividing the output from said voltage-to-frequency converter to provide a second drive signal, and for delivering said second drive signal to said second driver means to drive said recording head in the radial direction, whereby synchronized operation of said first and second driver means is provided.

4,351,045
TRACKING ERROR MEASUREMENT

James M. Townshend, 32 Mayo Rd., Walton-on-Thames, Surrey, England

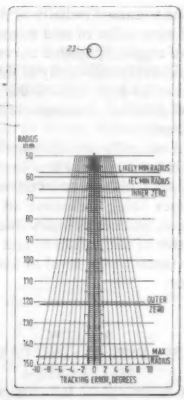
Filed Jul. 7, 1980, Ser. No. 166,447

Claims priority, application United Kingdom, Jul. 5, 1979, 7923545

Int. Cl.³ G11B *3/10*

U.S. Cl. 369—55 **14 Claims**

1. Apparatus for use in obtaining a measure of or relating to lateral tracking error at each of a plurality of predetermined radial distances from the spindle axis of turntable equipment that includes a spindle, a platter rotatable about the spindle axis, and a pivotally mounted tonearm, said apparatus comprising an alignment protractor in the form of a marked planar member apertured to fit on or over the spindle such as to overlie and/or rest on the platter, the member's markings defining a primary line to extend radially of the spindle axis and be indicative of zero value of said measure, a plurality of angularly spaced secondary lines to extend radially of the spindle axis to each side of the primary line and be indicative of different non-zero values of said measure respectively, and a plurality of mutually parallel transverse lines directed at right angles to said primary line for extension across the primary line and all said secondary lines, said transverse lines being indicative of said predetermined radial distances, and further comprising a device having mounting means whereby the device may be secured to the tonearm in place of the usual cartridge, said device incorporating a marked transparent planar surface to overlie and/or rest on the alignment protractor, the surface markings defining a scale comprising a main line which, when the device is secured to the tonearm as aforesaid, is directed to the tonearm at the offset angle for overlying colinear alignment with a selected one of the alignment protractor's transverse lines, the scale further comprising a plurality of equispaced distance marks directed transversely of said main line,



said distance marks defining stylus points of which any one can be selected to correspond to the particular tip of the stylus of the cartridge that has been replaced by the device.

8. A method of obtaining a measure of or relating to laterial tracking error at a predetermined radial distance from the spindle axis of turntable equipment that includes a spindle, a platter rotatable about the spindle axis, and a pivotally mounted tonearm to which a cartridge is usually secured, wherein said method comprises the steps of:

(a) mounting on the tonearm, in place of the usual cartridge, a device incorporating a marked transparent planar surface to overlie said platter, said markings defining a scale comprising a main line to be directed to the tonearm at the offset angle and further comprising a plurality of equispaced distance marks directed transversely of said main line to define stylus points of which any one may be selected to correspond to the tip of the stylus of the cartridge replaced by the device,

(b) placing on the platter an alignment protractor in the form of a marked planar member having an aperture whereby the member is fitted on or over said spindle such as to overlie the platter and extend beneath the marked planar surface of said device, the member's markings defining a primary line to extend radially of the spindle axis and be indicative of zero value of said measure, a plurality of angularly spaced secondary lines to extend radially of the

spindle axis to each side of the primary line and be indicative of different non-zero values of said measure respectively, and a plurality of mutually parallel transverse lines directed at right angles to said primary line for extension across the primary line and all said secondary lines, said transverse lines being indicative of said predetermined radial distances,

(c) pivoting the tonearm about its vertical pivot axis and arcuately moving the member about the spindle axis until the alignment protractor's particular transverse line corresponding to said predetermined radial distance is directed to the tonearm at the offset angle,

(d) determining which particular one of the alignment protractor's radial lines is coincident with the stylus point along said particular transverse line, and reading the value of the said measure indicated by that particular one of said radial lines.

14. Apparatus for use in obtaining a measure of audio distortion due to lateral tracking error at each of a plurality of predetermined radial distances from the spindle axis of turntable equipment that includes a spindle, a platter rotatable about the spindle axis, and a pivotally mounted tone arm, said apparatus comprising an alignment protractor in the form of a marked planar member apertured to fit on or over the spindle such as to overlie and/or rest on the platter, wherein the member's markings define

(a) a primary line to extend radially of the spindle axis and be indicative of zero value of said measure,

(b) a plurality of angularly spaced curved secondary lines to radiate progressively outwardly as they extend away from the spindle axis to each side of the primary line and be indicative of different non-zero values of said measure respectively, and

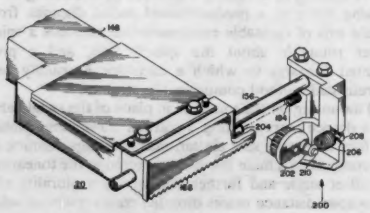
(c) a plurality of mutually parallel transverse lines directed at right angles to said primary line for extension across the primary line and all said curved secondary lines, said transverse lines being indicative of said predetermined radial distances, and said primary line and secondary lines being indicative of said values of said measure, said values being proportional to the level of audio distortion due to tracking error.

4,351,046

VIDEO DISC PLAYER HAVING CARRIAGE DETENT MECHANISM

Charles A. Elliott, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 25, 1981, Ser. No. 237,873
Int. Cl.³ G11B *3/36*
U.S. Cl. 369—233 **7 Claims**



1. In a player for recovering prerecorded signals from a disc record by means of a signal pickup housed in a translatable carriage; said player being equipped with a stop to limit the travel of said carriage in a first direction; a detent apparatus comprising:

means subject to engagement with said carriage during motion of said carriage toward said limit stop; and

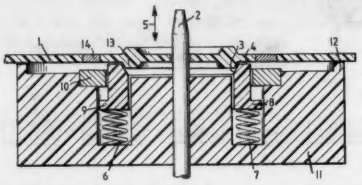
yieldable means responsive to said engagement for storing energy; said yieldable energy storing means exerting a force on said engagement means in a direction such that said carriage is urged toward said limit stop when said carriage is disposed within a given distance from said stop.

4,351,047

CENTERING OF A DISC-SHAPED RECORD CARRIER ON A TURNTABLE

Horst Redlich, Berlin; Heinz Borchard, Nortorf, and Rainer Ihlenburg, Berlin, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 2, 1980, Ser. No. 193,388
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1979, 2939865
Int. Cl.³ G11B *3/60*; G01B *25/04*
U.S. Cl. 369—270 **11 Claims**



1. In a device for centering a record disc with respect to a turntable, in which the disc is successively radially centered and axially positioned relative to the turntable, which device includes a centering shaft engageable with the disc to effect preliminary radial centering thereof, the improvement comprising: further radial centering means spaced from the shaft and mounted to engage a disc a location other than the center hole of the disc after the disc has engaged the shaft and to undergo yieldable movement relative to the turntable in the axial direction of the disc under the influence of its engagement with the disc for effecting final radial centering of the disc; and magnetic attracting means operatively associated with the disc and the turntable for axially positioning the disc after it has been finally radially centered.

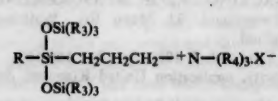
4,351,048

HIGH DENSITY INFORMATION DISC LUBRICANTS

David A. Berry, Columbus, Ohio, assignor to RCA Corporation, New York, N.Y.

Filed Aug. 27, 1981, Ser. No. 297,053
Int. Cl.³ G11B *3/70*; C07F *7/18*
U.S. Cl. 369—288 **3 Claims**

1. In a high density information record adapted for use with a playback stylus to effect recovery of signals occupying a bandwidth of at least several megahertz when relative motion at a desired rate is established between said record and said stylus, said record compising a disc of a conductive material containing an information track constituted by a surface relief pattern in said track to accommodate recovery of signals of said bandwidth upon establishment of relative motion at said rate, said record coated with a lubricant, the improvement comprising employing as said lubricant a silyl quaternary ammonium salt lubricant having the formula



wherein R is a lower alkyl group of 1–5 carbon atoms; R_3 is methyl or ethyl; R_4 is an alkyl group of 1–12 carbon atoms and X is $—OSO_2—(CH_2)_nCH_3$ wherein n is an integer of 5–12.

4,351,049
CIRCUIT ARRANGEMENT FOR USER STATIONS IN A COMMUNICATIONS NETWORK

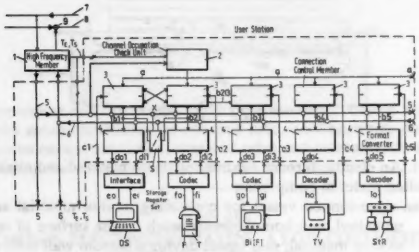
Rolf Nobis, Berlin, Fed. Rep. of Germany, assignor to Heinrich-Hertz-Institut für Nachrichtentechnik Berlin GmbH, Berlin, Fed. Rep. of Germany

Filed Nov. 8, 1979, Ser. No. 92,928

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1978, 2848931

Int. Cl.³ H04J *3/16, 6/02;* **H04Q** *11/04*

U.S. Cl. 370—62 **3 Claims**



1. In a digital, time-multiplex communications network operating simultaneously for a plurality of different kinds of user instruments and having a decentralized exchange and a plurality of user stations, with each user station being associated with at least one user instrument of at least one kind of user instruments and being provided with separate signal conducting lines for the conduction of signals in the transmitted and received directions, respectively, of the respective station, the network further having autonomous units including identical channel occupation check units each connected in a respective station and identical groups of devices each composed of a connection control member and a format converter, with each said group being connected to a respective user instrument and being connected to the channel occupation check unit in the user station of its respective user instrument, the improvement comprising: in each said user station, at least one set of devices composed of an additional connection control member connected to said channel occupation check unit associated with said station, and a storage register set connected to said separate signal conducting lines in said respective user station for the conduction of signals in the transmitted and received directions, respectively, said storage register set of each said station being further connected to said additional connection control member of the same station as well as to said connection control member of one said group of devices connected to a respective user instrument of said same station for control; and, in each said user station, a switching unit attached and connected to said user instrument which is connected to said one group of devices.

4,351,050
FAIL-SAFE CONTROL COMPUTER

Kazuhiro Higashiyama, Atsugi, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

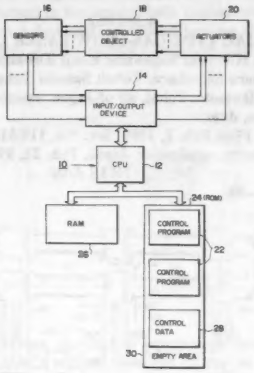
Filed Mar. 21, 1980, Ser. No. 132,423

Claims priority, application Japan, Mar. 23, 1979, 54-33884

Int. Cl.³ G06F *11/00*

U.S. Cl. 371—12 **9 Claims**

1. A method of operating a stored-program control computer system including a CPU and a ROM containing a control program and a memory area not directly used for the control program, said non-control-program area being loaded with instructions such that transfer of program control to substantially any one of these instructions eventually leads program control to a correction routine which is part of the control program, the program control having a tendency inadvertently to be at one of the instructions, comprising in response to the program control being inadvertently at one of the instructions



leading the program control to the correction which is part of the control program.

4,351,051
SEMICONDUCTOR LASER DEVICE WITH AN ASSEMBLY BLOCK

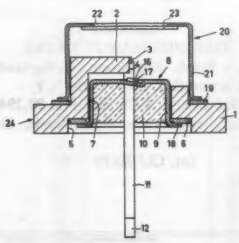
Antonius A. M. van Alem; Johan C. J. Finck, both of Eindhoven, and Peter W. M. van de Water, Nijmegen, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,200

Claims priority, application Netherlands, Jun. 26, 1979, 7904954

Int. Cl.³ H01S *3/19*

U.S. Cl. 372—36 **5 Claims**



1. A semiconductor laser device comprising a support, a semiconductor laser element mounted on the support, and a cap over said laser element which is provided with a light-transmitting window and is secured to the support, the support comprising a substantially annular assembly block of a metal having a good thermal conductivity, which assembly block comprises positioning means on its outer circumference for accurately locating the optical axis of said laser element and a sector-shaped supporting part which extends towards the axis through the center of the annular assembly block and which forms a connection and mounting area for the laser element which extends through said axis and is accurately located with respect to said positioning means, and a base having a supporting part on its lower side, mutually-insulated electrical conductors and a photodiode mounted on its upper side, said base being secured on the lower side of the assembly block remote from the supporting part, the cap having the light-transmitting window being secured at the upper side of the assembly block

and said window being located above said laser element and said photodiode.

4,351,052

COAXIAL TYPE GAS-FLOW LASER DEVICE

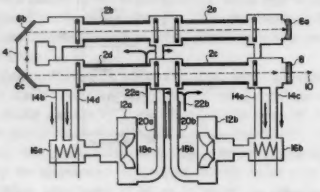
Kouji Sasaki; Hiroyuki Sugawara; Kouji Kuwabara, all of Hitachi; Toshiharu Shirakura, Tokai; Satoshi Takemori, Hitachi, and Norio Ikemoto, Tokai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 7, 1980, Ser. No. 119,316

Claims priority, application Japan, Feb. 21, 1979, 54-19393

Int. Cl.³ H01S *3/05*

U.S. Cl. 372—58 **4 Claims**



1. In a coaxial type gas-flow laser device having

an optical resonator which is constructed of an electric discharge portion filled with an active laser gas, a total-reflection mirror disposed at one end of said electric discharge portion and an output mirror disposed at the other end of said electric discharge portion,

heat exchanger means for cooling said laser gas heated by electric discharge, and

blower means for circulating said laser gas, a laser beam axis, an electric discharge axis and a gas flow axis being coincident, the improvement comprising said blower means being provided as at least one turbo-centrifugal blower and means for operating said blower at a rotational speed which is higher than 5000 r.p.m.

4,351,053

GAS DISCHARGE LASER

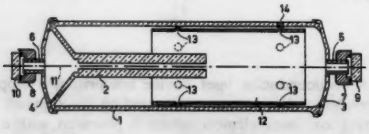
Hans G. van den Brink, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 3, 1979, Ser. No. 99,294

Claims priority, application Netherlands, Dec. 19, 1978, 7812287

Int. Cl.³ H01S *3/03*

U.S. Cl. 372—61 **15 Claims**



1. In a gas discharge laser including a tubular glass envelope having at least one wall and enclosing a discharge space containing an active lasing gas, means defining a resonant cavity within the glass envelope, means including first and second spaced apart electrodes within the glass envelope for producing an electric discharge in the discharge space, and means for abstracting energy from within the glass envelope, the improvement comprising wherein at least one of said electrodes comprises a rolled metal foil resiliently urged towards said wall of the glass envelope, and spacing means positioned at predetermined locations so that the metal foil engages the glass envelope only at said spacing means whereby the remainder of the metal foil is circumferentially substantially uniformly spaced apart from the wall of the glass envelope thereby producing a circumferentially symmetrical uniform heat transfer between the metal foil electrode and the glass envelope.

4,351,054

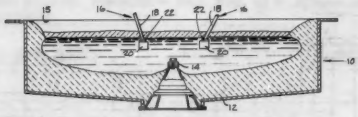
OPTIMIZED MIXING AND MELTING ELECTRIC FURNACE

Leonard E. Olds, Castle Rock, Colo., assignor to Manville Service Corporation, Denver, Colo.

Filed Mar. 4, 1981, Ser. No. 240,514

Int. Cl.³ C03B *5/027*

U.S. Cl. 373—38 **8 Claims**



1. An electric furnace for melting batch material and mixing molten material comprising:

an open-topped vessel for containing molten material and unmelted, non-homogeneous batch on the surface of said molten material, said vessel having a bottom wall with an outlet formed therein for discharging said molten material;

at least three electrodes which are laterally spaced from each other, each of said electrodes having a tip that is immersed in said molten material for conducting electrical current therethrough, each of said electrode tips having a substantially round lateral cross section and each of said electrode tips being positioned above said bottom wall outlet;

individual support arms which mount each of said electrodes, a plurality of elongated vertically extending frame members, vertical carriages supporting each of the support arms on said vertical frame members for movement therealong, first drive means for adjusting the position of each vertical carriage upon its vertical frame member, which drive means, in turn, adjusts the vertical positions of the electrode tips in the molten material;

a plurality of horizontally extending frame members supporting the vertical frame members by means of horizontal carriages for movement along said horizontal frame members, second drive means for adjusting the horizontal position of each horizontal carriage, its vertical frame member, its support arm and its electrode tip along its horizontal frame member, said second drive means being separately and independently operable from said first drive means during furnace operation.

4,351,055

WATER COOLED WALL ELEMENT FORMED OF TUBES FOR MELTING FURNACES

Klaus Bick, Paderborn; Lothar Harmsen, Lingen; Jürgen Zieschang, Lingen, and Friedhelm Vennmann, Lingen, all of Fed. Rep. of Germany, assignors to Benteler Werke AG, Paderborn, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 133,139

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1979, 2913092

Int. Cl.³ F27D *1/12*

U.S. Cl. 373—76 **11 Claims**

1. A water cooled wall element for at least partly replacing the casing of refractory material in melting furnaces, especially arc furnaces for melting steel, above the bath of molten material in the furnace, said water cooled wall element consisting of a plurality of parallel, horizontally extending superimposed fin tubes engaging each other in such a manner that the fins thereon form horizontally extending uninterrupted protrusions, with one of the fins on each tube projecting toward the

interior of the furnace especially to improve adhesion of slag thereon and the other fin on each tube projecting toward the exterior of said furnace, said superimposed tubes including an

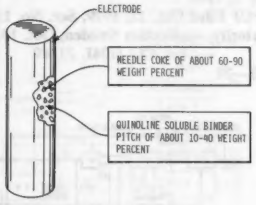
uppermost end tube and a lowermost end tube; cooling water inlet means connected to one end tube; cooling water outlet means connected to the other end tube; and return bends connecting the ends of approximal tubes to each other.

4,351,056

CARBON ELECTRODES HAVING A LOW COEFFICIENT OF THERMAL EXPANSION

Oliver A. Kiikka, Willoughby, and Donald R. Day, Garfield Heights, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Dec. 24, 1980, Ser. No. 219,888
Int. Cl.³ H05B *7/085*
U.S. Cl. 373—88 **2 Claims**



1. An improved carbon electrode having a coefficient of thermal expansion less than 3.5×10^{-7} comprising:

needle coke in an amount of from about 60 to 90 weight percent and having a coefficient of thermal expansion of up to about 8×10^{-7}; and

a quinoline soluble binder pitch in an amount of from about 10 to 40 weight percent, prior to baking and graphitization, said binder pitch having a ring and ball softening point of from about 94° to 150° C. consisting of a highly aromatic condensation product of a distilled cycle oil extract with an extractant selected from the group consisting of furfural, phenol, B,B'-dichloro diethyl ether, nitrobenzene and sulfur dioxide.

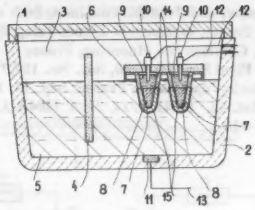
4,351,057

ELECTRIC INSTALLATION FOR HEATING OF MOLTEN METALS AND/OR SALTS AND SOLUTIONS

Felicjan Biolik; Adam Lukasik; Zagmunt Morys; Stanislaw Walawender, all of Katowice, and Szczepan Galazka, Myslowice, all of Poland, assignors to Biuro Projektow Przemyslu Metali Niezelaznych "BIPROMET", Katowice, Poland

Filed Jun. 9, 1980, Ser. No. 157,829
Int. Cl.³ H05B *3/60, 3/03*
U.S. Cl. 373—117 **26 Claims**

1. Electric installation for direct heating of a charge, such as a bath of metals and/or salts in melted state and solutions, comprising: at least one heating element for heating the charge, each heating element being in the form of a vessel or partition made of at least two parts of different physico-chemical properties, said parts being firmly joined to each other and having a portion immersed in the heated bath, contact materials being in contact with a first surface of said heating element, a first electrode dipped at least partially into said contact materials,



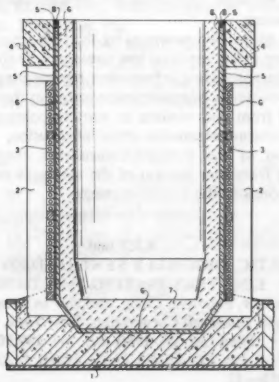
means for applying an electric potential difference between said electrode and a second electrode located at least partially in the bath, an electric circuit connected to said heating element and including current supply means to said electrodes, said bath being in contact with a second surface of said heating element, said contact materials being included in said electric circuit of said heating element.

4,351,058

INDUCTION CRUCIBLE FURNACE AND METHOD FOR ITS PREPARATION

Rudolf Florian, Mossenberg 34, D-4933 Blomberg, and Albert Herrmann, Bokelfennerstrasse 24, D-4815 Stukenbrock, both of Fed. Rep. of Germany

Filed Feb. 19, 1980, Ser. No. 122,715
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1979, 2906815
Int. Cl.³ F27B *14/10*; F27D *1/10*; H05B *5/16*
U.S. Cl. 373—155 **5 Claims**



1. An induction crucible furnace, comprising a housing including a bottom wall and side walls to define a furnace cage having an interior; a prefabricated crucible made of mixture of dry ramming material, sintering agent and cold-curing binder without application of elevated temperature and thereby without sintering the crucible, said crucible being positioned in said cage and having an outer peripheral surface; a plurality of induction coils surrounding said crucible and mounted on said side walls, said prefabricated crucible being positioned within the interior of said cage so that a peripheral boundary region is provided between the interior of said cage and said outer peripheral surface of said crucible; and a layer of non-sintering

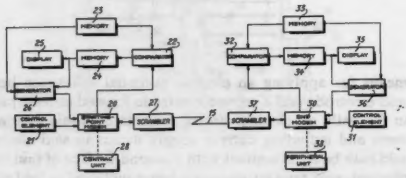
granular material disposed in said region, said layer being closed at the top thereof to secure the layer within the furnace.

4,351,059

METHOD FOR TESTING A DIGITAL DATA TRANSMISSION LINE BETWEEN TWO MODEMS AND A DEVICE FOR THE APPLICATION OF SAID METHOD

Michel Gregoire, and Jean C. Vuillemin, both of Conflans Ste Honorine, France, assignors to Lignes Telegraphiques et Telephoniques, Conflans Ste Honorine, France

Filed Sep. 16, 1980, Ser. No. 187,771
Claims priority, application France, Sep. 18, 1979, 79 23241
Int. Cl.³ H04L *1/14, 1/16;* H04B *3/46*
U.S. Cl. 375—10 **12 Claims**



1. A method of testing a line for the transmission of digital data between two modems, wherein said method comprises the following steps:

transmission of a predefined test message from the first modem selected as a starting-point of the test to the second modem located at the other end of the line to be tested;

reception of said predefined test message by the end modem;

comparison of the message received with the test message for determining information representing the existence or non-existence of transmission errors in the direction considered from starting-point modem to end modem or so-called forward-transmission error information;

transmission by the end modem of the test message and of a second message containing the forward-transmission error information;

reception of the two messages by the starting-point modem;

comparison of the received test message with the test message itself, thus providing information representing the existence or non-existence of transmission errors in the direction considered from end modem to starting-point modem or so-called return-transmission error information;

recognition of the forward-transmission error information starting from that portion of the messages received which corresponds to the second message.

4,351,060

AUTOMATIC, DIGITALLY SYNTHESIZED MATCHING LINE TERMINATING IMPEDANCE

Robert Treiber, Fairfield, Conn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 23, 1980, Ser. No. 199,904
Int. Cl.³ H03H *17/02;* H04B *3/20*
U.S. Cl. 375—12 **15 Claims**

1. A circuit for automatically digitally synthesizing an output matching line terminating impedance comprising:

analog to digital conversion means for converting negative feedback analog communication signals occurring at circuit output terminals to negative feedback digital signals;

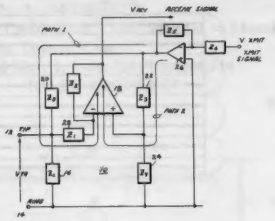
means for summing said negative feedback digital signals with input digital communication signals providing a composite digital signal input;

digital filter means having said composite digital signal input coupled thereto for directly establishing a predetermined output impedance characteristic, said digital filter having filter coefficients, and having a digital signal output;

means for selectively altering said filter coefficients;

digital to analog conversion means for converting said digital signal output to an analog voltage signal; and

means for converting said analog voltage signal to an analog current having a high output impedance characteristic



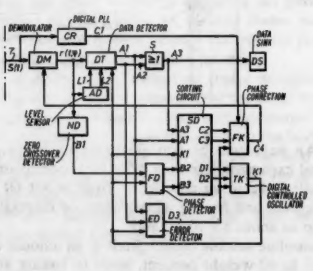
compared to the matched line and to the synthesized impedance such that said analog current is coupled to said circuit output terminals and to said analog to digital conversion means.

4,351,061

METHOD OF PHASE SYNCHRONIZATION IN A SYNCHRONOUS DATA TRANSMISSION SYSTEM, AND APPARATUS FOR CARRYING OUT THE METHOD

Jan S. Hedin, Tumba, and Göran A. Jarnestedt, Johanneshov, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE79/00204, § 371 Date Jun. 13, 1980, § 102(e) Date May 30, 1980, PCT Pub. No. WO80/00903, PCT Pub. Date May 1, 1980
PCT Filed Oct. 12, 1979, Ser. No. 195,420
Claims priority, application Sweden, Oct. 13, 1978, 7810735
Int. Cl.³ H04L *25/49*
U.S. Cl. 375—20 **8 Claims**



1. In a synchronous data transmission system having a transmitter which emits a single side band carrier of a first frequency amplitude-modulated by a signal derived from a binary pulse train of pulses of the Partial Response Class 4 type coding whereby a binary pulse train of a second frequency is transmitted and a receiver which demodulates the signal transmitted thereto to a base band signal with the aid of a first signal having the first frequency and detecting the binary signals therefrom with the aid of a clock signal of the second frequency derived from the base band signal, a method phase synchronizing the receiver to the transmitter comprising the steps of:

(a) detecting, in the base band signal, a given multibit binary sequence;

(b) zero-crossing detecting the base band signal at the receiver; and

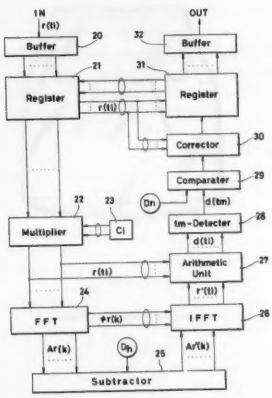
(c) phase comprising each generated zero-crossing signal with the clock signal derived from the base band signal to increase the frequency of the clock signal when the zero crossing signal leads the clock signal in phase and to decrease the frequency of the clock signal when the zero

crossing signal lags the clock signal only when there is detected the given multibit binary sequence.

4,351,062
METHOD AND APPARATUS FOR SUPPRESSING DIGITAL ERROR NOISE IN DIGITAL COMMUNICATION

Kiyosumi Yoshiya, Kodaira, Japan, assignor to Radio Research Laboratories, Ministry of Posts and Telecommunications, Tokyo, Japan

Filed Oct. 8, 1980, Ser. No. 195,336
Claims priority, application Japan, Jan. 29, 1980, 50-008285
Int. Cl.³ H03K *5/01*
U.S. Cl. 375—99 **8 Claims**



1. A method for the suppression of digital error noise in received sampled signals in digital telecommunication, which method comprises the steps of:

subjecting said received sampled signals to Fourier transform to extract a frequency spectrum composed of an amplitude spectrum and a phase spectrum;

subtracting from said amplitude spectrum a flat spectrum determined by the maximum level of said sampled signals to obtain a subtracted amplitude spectrum;

synthesizing said subtracted amplitude spectrum and said phase spectrum to produce spectrum-subtracted signals;

extracting the difference between each of said sampled signals and each of said spectrum-subtracted signals to obtain a differential signal waveform;

detecting a particular signal having a conspicuously large amplitude occuring in said differential signal waveform;

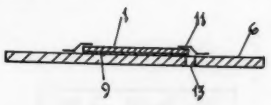
comparing said large amplitude with a fixed threshold value; and

correcting the particular signal of said large amplitude, when the amplitude is greater than said threshold value, by use of interpolation with respect to the preceding and following sets each of several sampled signals between which said particular signal having the large amplitude is interposed.

4,351,063
X-RAY DIFFRACTION APPARATUS

Colin Dineen, Buckinghamshire, and Christopher A. Wallace, London, both of England, assignors to Elliott Brothers (London) Limited, Chelmsford, England

Filed Aug. 27, 1980, Ser. No. 181,851
Claims priority, application United Kingdom, Aug. 28, 1979, 7929729
Int. Cl.³ G01M *23/20*
U.S. Cl. 378—79 **3 Claims**



1. X-ray diffraction apparatus comprising:

(A) an X-ray source,

(B) a crystal mounting plate transparent to X-rays,

(C) means for imposing a curvature on the mounting plate of such form that, for a crystal slice clamped to the mounting plate the angle of incidence of X-rays diverging from said X-ray source to the crystal slice is substantially constant over the surface of the crystal slice, and

(D) pneumatic pressure clamping means for clamping the crystal slice to the mounting plate, said clamping means including

(i) a sheet of flexible material transparent to X-rays arranged to overlie the crystal slice and mounting plate so that a peripheral chamber is formed between the edge of the crystal slice and the sheet of material,

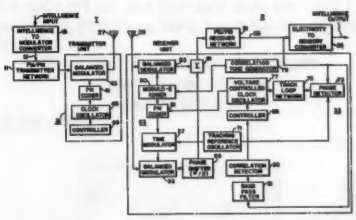
(ii) said peripheral chamber being evacuated in operation,

(iii) X-ray topographs of said crystal slice being thereby obtainable both by transmission and reflection.

4,351,064
COMMUNICATION

Walter Ewanus, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 86,999, Oct. 30, 1970, which is a continuation of Ser. No. 754,375, Aug. 21, 1968, abandoned. This application Jan. 31, 1973, Ser. No. 328,213
Int. Cl.³ H04B *1/10*; H04K *1/00*
U.S. Cl. 455—29 **6 Claims**



1. Communication apparatus for communicating intelligence including a transmitter unit having

(a) a transmitter network for producing a carrier,

(b) input means, connected to said network, for modulating said carrier with an input signal containing intelligence to be communicated, and

(c) modulator means, connected to said network, for impressing on said carrier a pseudo-noise code,

(d) a receiver unit having a receiver network for receiving the output of said transmitter including said intelligence and conditioning said output to be converted into intelligence perceptable form said receiver network being of the

type including means for demodulating a modulated carrier, the said demodulating means including a limiter;

(e) an auto-correlation network including a first correlation branch conducting the modulated carrier and a second correlation branch conducting the modulated carrier;

(f) means connected to said correlation network, for dephasing the output of one of said branches with respect to the output of the other of said branches to produce a signal, dependant on the sum of the outputs of said branches, capable of being passed by said limiter;

(g) means connected to said first and second branches for impressing said sum-dependent signal on said receiver network, and

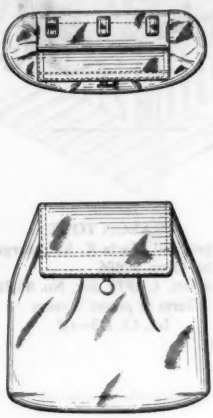
(h) means, connected to said receiver network and to said correlation network, for impressing on said sum-dependant signal a tracking signal manifested by a variation of the phase of the sum-dependant signal impressed on said receiver network and capable of being passed by said limiter said tracking signal cooperating with said sum-dependant signal to actuate said auto-correlation network to auto-correlate said code; and communication means between said transmitter network and said receiver network.

266,200

BELT MOUNTED ACCESSORY BAG OR THE LIKE

Charles Berman, 6025 Shore Blvd., South No. 614, Gulfport, Fla. 33707

Filed May 15, 1980, Ser. No. 150,162
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—400

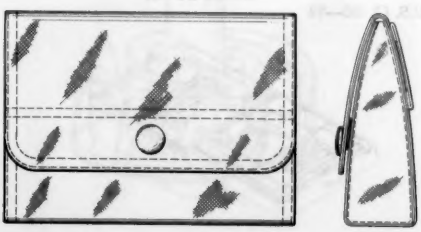


266,201

BELT MOUNTED MAKE-UP CASE OR THE LIKE

Charles Berman, 6025 Shore Blvd., South No. 614, Gulfport, Fla. 33707

Filed May 15, 1980, Ser. No. 150,163
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—400

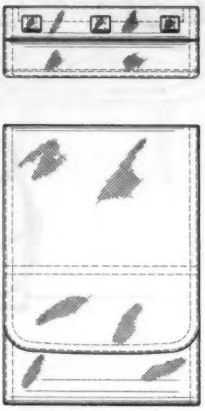


266,202

BELT MOUNTED BAG OR THE LIKE

Charles Berman, 6025 Shore Blvd., South No. 614, Gulfport, Fla. 33707

Filed May 15, 1980, Ser. No. 150,164
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—400

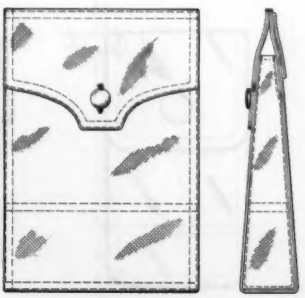


266,203

BELT MOUNTED ACCESSORY BAG OR THE LIKE

Charles Berman, 6025 Shore Blvd., South No. 614, Gulfport, Fla. 33707

Filed May 15, 1980, Ser. No. 150,165
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—400



266,204

BELT MOUNTED CIGARETTE CASE OR THE LIKE

Charles Berman, 6025 Shore Blvd., South No. 614, Gulfport, Fla. 33707

Filed May 15, 1980, Ser. No. 150,166

Term of patent 14 years

Int. Cl. D02—*99*

U.S. Cl. D2—400

266,205

BELT MOUNTED EYEGLASS CASE OR THE LIKE

Charles Berman, 6025 Shore Blvd., South No. 614, Gulfport, Fla. 33707

Filed May 15, 1980, Ser. No. 150,167

Term of patent 14 years

Int. Cl. D2—*99*; D3—*02*

U.S. Cl. D3—34

266,206

LUGGAGE

Ted Stark, Montclair, N.J., assignor to M & M Luggage Co., Inc., Jersey City, N.J.

Filed Dec. 6, 1979, Ser. No. 100,812

Term of patent 14 years

Int. Cl. D3—*61*

U.S. Cl. D3—71

266,207

CRAYON TOTE

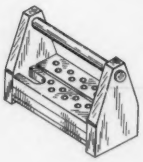
Gary D. Kirchberger, and Maria K. Kirchberger, both of 2200 SW. 195th, Aloha, Oreg. 97006

Filed Oct. 1, 1979, Ser. No. 80,319

Term of patent 7 years

Int. Cl. D3—*02*

U.S. Cl. D3—30.1



266,208

VIDEO GAME TOTE CASE

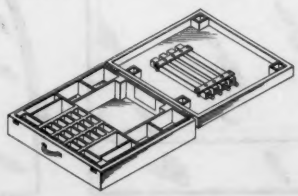
Gary L. Cannon, 3066 La Mantia Dr., and Ronald B. Wilkins, 1590 Hooper Rd., both of Yuba City, Calif. 95991

Filed Jun. 25, 1979, Ser. No. 51,739

Term of patent 14 years

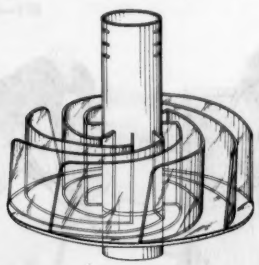
Int. Cl. D3—*02*

U.S. Cl. D3—74

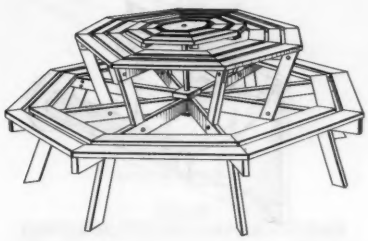


266,209
SWINGING CRADLE
Elizabeth F. Rogers, 3638 Mohave Way, Scottsdale, Ariz. 85251
Filed Sep. 24, 1979, Ser. No. 78,483
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—15

266,210
DISPLAY RACK MODULE
Wolf-Dietrich Hannecke, Rischenau Weg 6, 3410 Northeim, Fed. Rep. of Germany
Filed May 14, 1979, Ser. No. 38,723
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1979, 11 MR 47
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—25

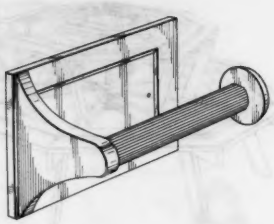


266,211
COMBINED TABLE AND SEATING UNIT
Howard L. Thom; Leslie A. Thom, and Linda D. Padilla, all of Rte. 1 South, Box 327, Laurel, Mont. 59044
Filed Sep. 23, 1980, Ser. No. 189,746
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—45

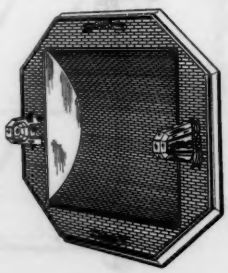


266,212
WALL RAIL FOR HAND SHOWERS
Andreas Haug, Altensteig, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany
Filed May 13, 1980, Ser. No. 149,373
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1979, MR 980 0B
Term of patent 14 years
Int. Cl. D06—*06*
U.S. Cl. D6—86

266,213
TOILET TISSUE ROLL HOLDER
John Heil, Dayton, Ohio, assignor to Allcraft Plastic Company, Inc., Dayton, Ohio
Filed Mar. 13, 1981, Ser. No. 243,524
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D6—97

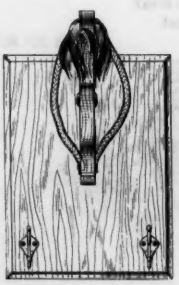


266,214
BATHROOM ACCESSORY HOUSING
Reg Littlefield, Toronto, Canada, assignor to Aqualine Products Limited, Mississauga, Canada
Filed Jul. 17, 1981, Ser. No. 284,174
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97

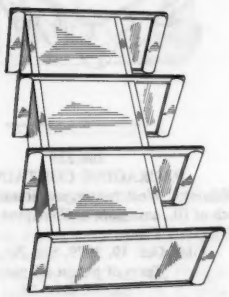


266,215
SUSPENDIBLE WINE RACK
Harry S. Bratton, P.O. Box 20408, Tallahasse, Fla. 32304
Filed Dec. 21, 1979, Ser. No. 106,249
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—113

266,216
COAT RACK
Lawrence P. Markin, and Marsha A. Markin, both of R.R. #1, Box 110, Moline, Ill. 61265
Filed Dec. 8, 1980, Ser. No. 214,435
Term of patent 14 years
Int. Cl. D6—*06;* D11—*02*
U.S. Cl. D6—116

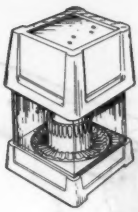


266,217
MODULAR CABINET UNIT
Gerd Lange, Kapsweyer, Fed. Rep. of Germany, assignor to Schlapp Moebel GmbH & Co KG, Neu-Anspach, Fed. Rep. of Germany
Filed Mar. 20, 1979, Ser. No. 22,155
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 59
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—168



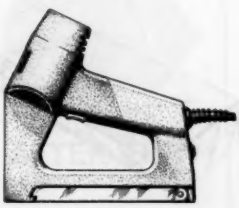
266,218
COLLAPSIBLE TEA TABLE OR SIMILAR ARTICLE
Hollis C. Hodson, P.O. Box 114, Amo, Ind. 46103
Filed Dec. 18, 1979, Ser. No. 104,872
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—178

266,219
DISPLAY CASE
Frank W. Brittner, 2719 Edison St., Pittsburgh, Pa. 15212
Filed Sep. 14, 1979, Ser. No. 75,825
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—172



266,220
DINNER PLATE OR SIMILAR ARTICLE
Frank A. Warren, Denville, N.J., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Sep. 22, 1980, Ser. No. 189,792
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—35

266,221
ELECTRIC STAPLER
John F. Ewig, Worcester, Mass., assignor to Parker Manufacturing Company, Worcester, Mass.
Filed May 12, 1980, Ser. No. 148,719
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—49



266,222

ROTARY SHEAR FOR USE IN CUTTING CLOTH AND THE LIKE

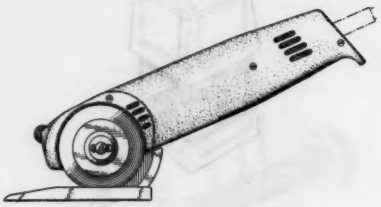
John H. Buscher, East Amherst, N.Y., assignor to Eastman Machine Company, Buffalo, N.Y.

Filed Jun. 23, 1980, Ser. No. 161,903

Term of patent 14 years

Int. Cl. D8—*05*

U.S. Cl. D8—61



266,223

PICTURE HANGING BRACKET

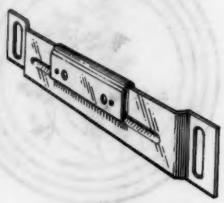
Dorian J. Swartz, 4802 Brookway Ave., Yorba Linda, Calif. 92686

Filed Aug. 8, 1980, Ser. No. 176,391

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—373



266,224

MULTI-PACK CIGARETTE PACKAGE

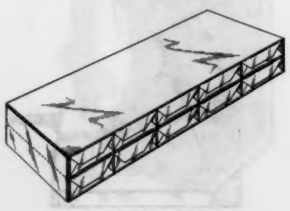
Wilhelm B. Bronander, Jr., 117 Bellevue Ave., Upper Montclair, N.J. 07043

Filed Jun. 4, 1979, Ser. No. 45,542

Term of patent 14 years

Int. Cl. D9—*03*

U.S. Cl. D9—337



266,225

COMBINED EGG BOX AND COVER

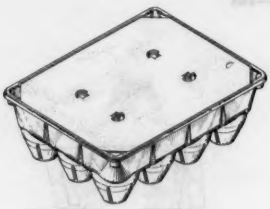
Alain Villotte, Paris, France, assignor to Societe Europeenne pour la Transformation des Produits de Synthese Seprosy, Paris, France

Filed Aug. 1, 1980, Ser. No. 174,529

Term of patent 14 years

Int. Cl. D9—*03*

U.S. Cl. D9—345



266,226

PACKAGING CONTAINER

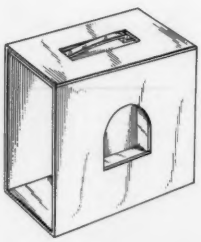
Robert C. Zdarsky, Westchester, and Russell J. Lyons, Franklin Park, both of Ill., assignors to Champion International Corporation, Stamford, Conn.

Filed Oct. 19, 1979, Ser. No. 86,409

Term of patent 14 years

Int. Cl. D9—*03*

U.S. Cl. D9—418



266,227

CONTAINER FOR A PLURALITY OF CAPACITORS

A. Franklin LaBarbara, 6 Northcreek Rd., Eatons Neck, N.Y. 11768

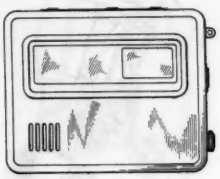
Filed Aug. 28, 1980, Ser. No. 182,066

Term of patent 14 years

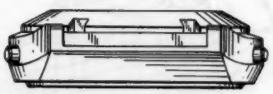
Int. Cl. D9—*03*

U.S. Cl. D9—424

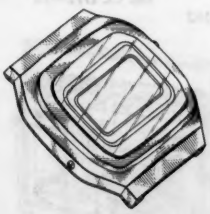
266,228
POCKET CLOCK
Yasuo Inora, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Feb. 27, 1980, Ser. No. 125,252
Claims priority, application Japan, Aug. 28, 1979, 54-35822
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



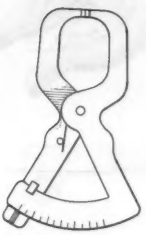
266,229
WATCH
Tetsuo Okaya, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed Feb. 29, 1980, Ser. No. 125,820
Claims priority, application Japan, Sep. 5, 1979, 54-37175
Term of patent 3½ years
Int. Cl. D10—*02*
U.S. Cl. D10—38



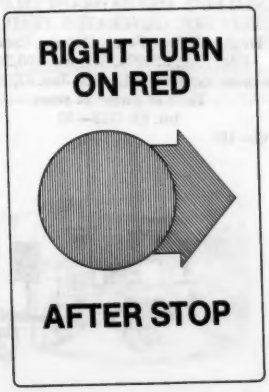
266,230
WRIST WATCH OR THE LIKE
Kaoru Tsukahard, Higashimurayama, Japan, assignor to Casio Computer Co. Ltd., Tokyo, Japan
Filed Mar. 10, 1980, Ser. No. 128,373
Claims priority, application Japan, Oct. 22, 1979, 54-44374
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38



266,231
SKINFOLD CALIPER
Dennis D. Windscheffel, 1604 Siwanoy Dr., Alhambra, Calif. 91803
Filed Sep. 22, 1980, Ser. No. 189,700
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73

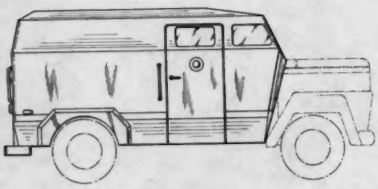


266,232
TRAFFIC SIGN
Peter Van Gel, 20 Vernon Rd., Natick, Mass. 01760
Filed Feb. 5, 1980, Ser. No. 118,785
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109



266,233
JEWELRY FINDING
Richard Governali, 1040 Sanford Ave., Irvington, N.J. 07111
Filed Aug. 18, 1980, Ser. No. 177,260
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—1

266,234
BODY OF AN ARMORED LAND VEHICLE
Walter R. Colwell, 414 Via Alegre, San Clemente, Calif. 92672
Filed May 12, 1980, Ser. No. 148,705
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—12

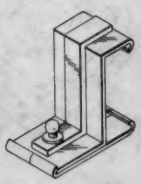


266,235
COMBINED PIPE AND HYDRANT THAWING AND ELECTRIC GENERATOR TRAILER
Douglas B. Hughes, Rideau Ferry, Ontario, Canada (K0G 1W0)
Filed Dec. 5, 1979, Ser. No. 100,363
Claims priority, application Canada, Jun. 12, 1979, 12-06-79-2
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—101

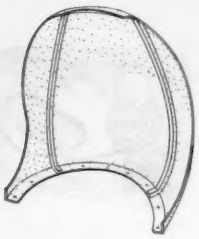
266,236
COMBINED BABY STROLLER AND BASKET
Shinroku Nakao, Yokohama, and Kouichi Kobayashi, Tokyo, both of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Dec. 3, 1980, Ser. No. 215,884
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—129

266,237
PICK-UP TRUCK BED ENCLOSURE
Wilbert L. Skidmore, Benzonia, Mich., assignor to Glas-Tek, Inc., Benzonia, Mich.
Filed Oct. 1, 1979, Ser. No. 80,438
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156

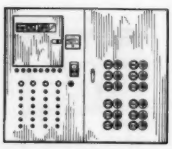
266,238
DETACHABLE FRONT BUMPER HITCH
Lawrence M. Miller, 407 - 4th St. West, Lemmon, S. Dak. 57638
Filed Jan. 4, 1980, Ser. No. 109,571
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—162



266,239
TRAILER WIND DEFLECTOR
Frederick R. Faust, New Braunfels, Tex., assignor to Thomas O. Hudson and Patricia Ann Hudson, both of Ada, Okla.
Filed Feb. 13, 1981, Ser. No. 234,160
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181

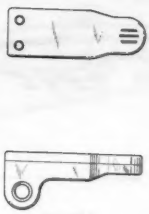


266,240
MULTI-ZONE ENERGY SUPPLY CONTROL
Thomas L. Garver, Kannapolis, N.C., assignor to W. A. Brown & Son, Inc., Salisbury, N.C.
Filed Feb. 13, 1980, Ser. No. 121,228
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12

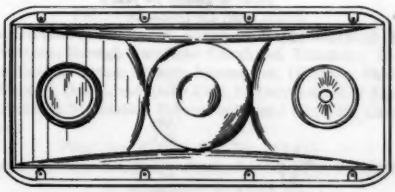


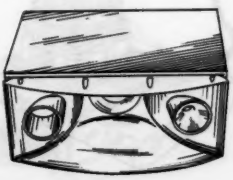
266,241
COMBINED RADIO RECEIVER AND TAPE RECORDER
Manao Nakamura, Ikoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sep. 30, 1980, Ser. No. 192,585
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—5

266,242
MICROPHONE HOUSING
William Radzelovage, Londonderry, N.H., assignor to Gentex Corporation, Carbondale, Pa.
Filed Apr. 14, 1980, Ser. No. 139,987
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—12

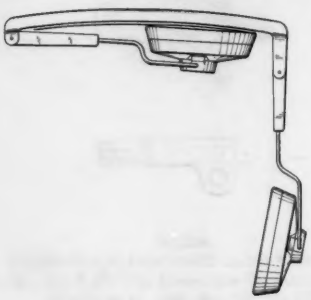


266,243
LOUDSPEAKER
John T. Gollehon, Grand Rapids, Mich., assignor to Gollehon Industries, Inc., Grand Rapids, Mich.
Filed Jun. 2, 1980, Ser. No. 155,226
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—34





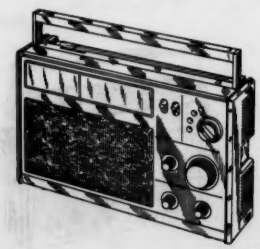
266,244
COLLAPSIBLE HEADSET
Alan Hofer, Wantaugh, and Frank Frielingsdorf, Port Jefferson, both of N.Y., assignors to Pickering & Company, Inc., Plainview, N.Y.
Filed May 30, 1979, Ser. No. 43,663
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—36



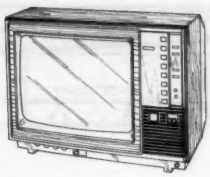
266,245
TELEPHONE
Wesley L. Thomas, 109 S. Catalina St., Los Angeles, Calif. 90004
Filed Jul. 23, 1979, Ser. No. 59,572
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

266,246
COMBINED TELEPHONE STAND AND LAMP THEREFOR
Nathaniel Sheppard, Jr., 8686 Elmtree St., Cincinnati, Ohio 45231
Filed Jun. 16, 1980, Ser. No. 160,070
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60

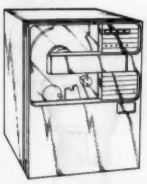
266,247
RADIO RECEIVER
Peter H. J. van de Ven, Valkenswaard, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 27, 1980, Ser. No. 163,765
Claims priority, application United Kingdom, Jan. 3, 1980, 993032
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70



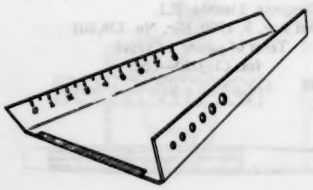
266,248
TELEVISION RECEIVER
Masahide Aoki, Tokyo; Takeichi Obata, Hino, and Takashi Fujii, Musashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 4, 1980, Ser. No. 174,904
Claims priority, application Japan, Feb. 29, 1980, 55-7326
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—80



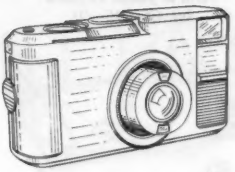
266,249
MAGNETIC TAPE DRIVE UNIT FOR A COMPUTER SYSTEM
Yoshiaki Tsuchihashi, Kokubunji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed May 7, 1980, Ser. No. 147,478
Claims priority, application Japan, Feb. 1, 1980, 55-2790
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—108



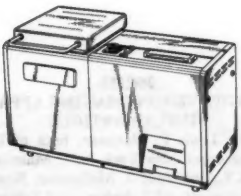
266,250
FUNNEL TRAY
John D. Gallagher, R.R. #1, Ingelwood, Ontario, Canada
Filed Sep. 23, 1980, Ser. No. 190,180
Claims priority, application Canada, Apr. 14, 1980, 14-04-80-5
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—140



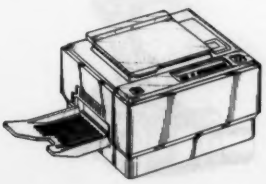
266,251
PHOTOGRAPHIC CAMERA
Herbert Schultes, Fürstenfeldbruck, and Karl-Heinz Rubner, Munich, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Jul. 31, 1980, Ser. No. 175,190
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—1



266,252
MICRO FICHE DUPLICATOR
Shigeo Sumi, Hasuda, and Hideaki Nagata, Tokyo, both of Japan, assignors to Somar Manufacturing Co., Ltd., Tokyo, Japan
Filed Apr. 25, 1980, Ser. No. 143,679
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—27



266,253
PHOTOCOPYING MACHINE
Shuzo Horikoshi, Kawanishi; Yoshihiko Sugiyama, Nara; Ken Kawamura, Ibaragi; Yoshihiko Kawakami, Takatsuki; Teruo Kuriyagawa, Osaka; Makoto Matsumura, Hirakata; Shoichi Kobayashi, Osaka, and Keiko Akai, Shijonawate, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 4, 1980, Ser. No. 109,616
Claims priority, application Japan, Jul. 13, 1979, 54-29355
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



266,254

PHOTOCOPYING MACHINE

Shuzo Horikoshi, Kawanishi; Yoshihiko Sugiyama, Nara; Ken Kawamura, Ibaragi; Yoshihiko Kawakami, Takatsuki; Teruo Kuriyagawa, Osaka; Makoto Matsumura, Hirakata; Shoichi Kobayashi, Osaka, and Keiko Akai, Shijonawate, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

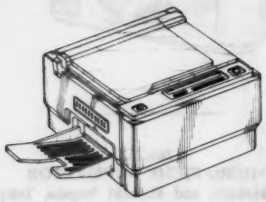
Filed Jan. 4, 1980, Ser. No. 109,617

Claims priority, application Japan, Jul. 13, 1979, 54-29354

Term of patent 14 years

Int. Cl. D16—*03*

U.S. Cl. D16—31



266,255

AVIATOR NIGHT VISION IMAGING APPARATUS OR SIMILAR ARTICLE

James H. Burbo; Louis P. Hartman, both of Roanoke, Va.; Douglas M. Spranger, New York, N.Y.; Malcolm J. Brookes, New York, N.Y., and Paul J. Mulhauser, New York, N.Y., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 22, 1980, Ser. No. 171,077

Term of patent 14 years

Int. Cl. D16—*06*

U.S. Cl. D16—133

266,256

RIBBON CASSETTE OR SIMILAR ARTICLE

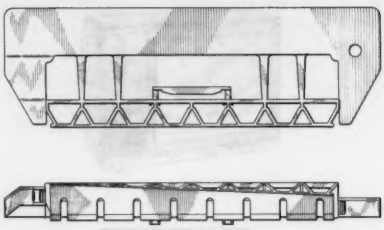
Michael O. Grey, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 11, 1980, Ser. No. 120,167

Term of patent 14 years

Int. Cl. D18—*99*

U.S. Cl. D18—12



266,257

HAND OPERATED INK STAMP

Robert H. Ahrens, Janesville, Wis., assignor to Schwaab, Inc., Milwaukee, Wis.

Filed Jul. 18, 1980, Ser. No. 170,039

Term of patent 14 years

Int. Cl. D19—*02*

U.S. Cl. D18—15

266,258

FOUNTAIN PEN

Arnold G. Lockwood, Warwick; William E. Tucker, Harmony, and Robert L. Harris, North Scituate, all of R.I., assignors to A. T. Cross Company, Lincoln, R.I.

Filed Apr. 9, 1980, Ser. No. 138,601

Term of patent 14 years

Int. Cl. D19—*06*

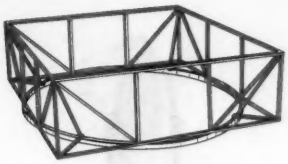
U.S. Cl. D19—49

266,259
FOUNTAIN PEN REFILL INK CARTRIDGE
William E. Tucker, Harmony, and George W. Graham, North Kingstown, both of R.I., assignors to A. T. Cross Company, Lincoln, R.I.
Filed Apr. 22, 1980, Ser. No. 142,700
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—54

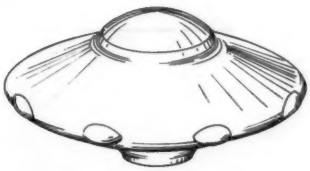
266,260
MAGNETIC MEMO HOLDER
Ruediger Einhorn, Katonah, and Lee R. Chasen, Port Chester, both of N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.
Filed Nov. 12, 1980, Ser. No. 206,043
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—91

266,261
MAGNETIC MEMO HOLDER
Ruediger Einhorn, Katonah, and Lee R. Chasen, Port Chester, both of N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.
Filed Nov. 12, 1980, Ser. No. 206,044
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—91

266,262
WATER TOWER SIGN FRAME
Davis W. Pennington, 9336 W. Washington Blvd., Culver City, Calif. 90230
Filed May 19, 1981, Ser. No. 264,607
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—10

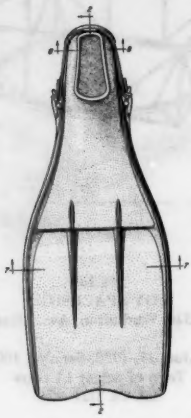


266,263
TOY SPACESHIP
Barbara Zachar, 324 Warbutron Ave., Hastings-on-Hudson, N.Y. 10706
Filed Jun. 17, 1980, Ser. No. 160,208
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—86



266,264
GOLF BALL RETRIEVER
Wilfred H. West, 6520 Lucas Ave., Oakland, Calif. 94611
Filed Jan. 31, 1980, Ser. No. 117,093
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D21—206

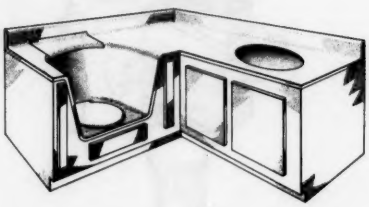
266,265
SWIM FIN
William A. Bowden, Glenview, Ill., assignor to Dacor Corporation, Northfield, Ill.
Filed Oct. 17, 1978, Ser. No. 952,072
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—239



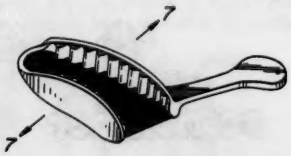
266,266
JIGGING LURE
Joseph A. Plamondon, Campbell River, Canada, assignor to Jerry Hardy and James Hoarce Darken, both of Campbell River, Canada
Filed Jul. 14, 1980, Ser. No. 168,814
Claims priority, application Canada, Feb. 1, 1980, 01-02-80-3
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

266,267
FISHING LURE
Ernest J. Ross, 1654 - 127th St., Surrey, British Columbia, Canada (V4A 3SI)
Filed Sep. 15, 1980, Ser. No. 187,208
Claims priority, application Canada, Mar. 31, 1980, 31-03-80-7
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

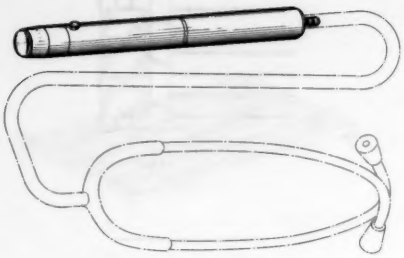
266,268
COMBINED WATER CLOSET COVER AND BATHROOM CABINET
Michael Adamcik, 357 Lakeview Dr., North Fort Myers, Fla. 33903
Division of Ser. No. 927,899, Jul. 25, 1978, abandoned. This application Jan. 22, 1980, Ser. No. 114,308
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69



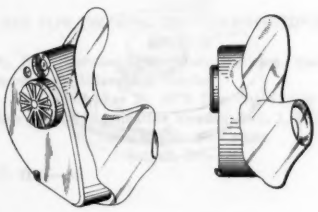
266,269
DENTAL BITE TRAY
Samuel R. Werrin, Pittsburgh, Pa., assignor to Premier Dental Products Company, Norristown, Pa.
Filed Jul. 9, 1980, Ser. No. 167,114
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10



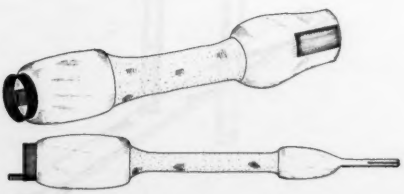
266,270
FETUS PULSE AND BLOOD FLOW DETECTOR
Masuo Sugawara, Tokorozawa, and Hiroji Matsumoto, Kawasaki, both of Japan, assignors to Hayashi Denki Company Ltd., Kanagawa, Japan
Filed Mar. 5, 1979, Ser. No. 17,340
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17



266,271
HEARING AID
Donald L. Johanson, Wayland, and Thomas S. Chan, Somerville, both of Mass., assignors to Audivox, Inc., Newton, Mass.
Filed Jan. 29, 1979, Ser. No. 7,190
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—35



266,272
THERMAL ICE POUCH
Harvey E. Christensen, 508 6th St. NE., Conover, N.C. 28613; Charles H. Moretz, and John M. Moretz, both of P.O. Box 551, Newton, N.C. 28658
Filed May 5, 1980, Ser. No. 146,236
Term of patent 14 years
Int. Cl. D24—*04*; D7—*99*
U.S. Cl. D24—43



266,273
INFANT BOTTLE HOLDING DEVICE
Wayne E. Bass, 8839 Keremeos Way, San Diego, Calif. 92126
Filed Jun. 9, 1980, Ser. No. 157,816
Term of patent 3½ years
Int. Cl. D24—*04*
U.S. Cl. D24—48

266,274
SAWBUCK
Gale A. Arns, 403 E. 6th St., Newberg, Oreg. 97132
Filed Aug. 25, 1980, Ser. No. 180,648
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—67

266,275

FRAME MEMBER FOR WINDOWS OR THE LIKE

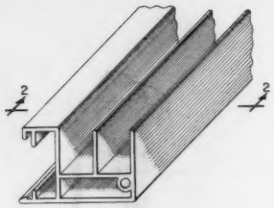
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.

Filed Sep. 11, 1980, Ser. No. 186,726

Term of patent 14 years

Int. Cl. D25—*01*

U.S. Cl. D25—74



266,276

MOTORCYCLE LIGHT AND THE LIKE

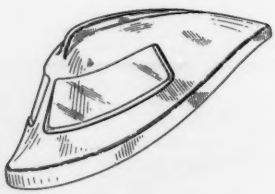
James M. Preisler, Bloomington, Minn., assignor to Thomas H. Rudd, Wayzata, Minn.

Filed Feb. 4, 1980, Ser. No. 117,916

Term of patent 14 years

Int. Cl. D26—*06*

U.S. Cl. D26—28



266,277

ELECTROLIER

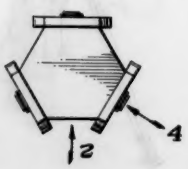
Gregory P. Tobias, 8937 S. Dalton Ave., Los Angeles, Calif. 90047

Filed Jun. 6, 1980, Ser. No. 157,142

Term of patent 14 years

Int. Cl. D26—*05*

U.S. Cl. D26—111



266,278

HAIR STYLING IMPLEMENT OR SIMILAR ARTICLE

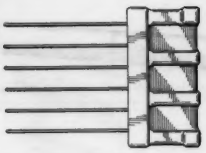
Anthony L. Daddona, Jr., 1540 Scalp Ave., Johnstown, Cambria County, Pa. 15904

Filed Jul. 7, 1980, Ser. No. 166,603

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D28—21



266,279

DENTAL FLOSS HOLDER

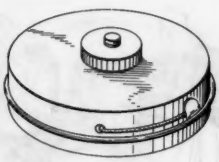
John Strother, 175 W. 137th St., New York, N.Y. 10030

Filed May 2, 1979, Ser. No. 35,293

Term of patent 14 years

Int. Cl. D28—*99*

U.S. Cl. D28—64



266,280

BACK SCRATCHER

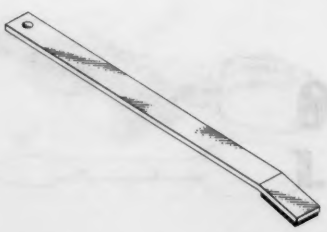
James Toyama, 1980 Cedar Ave., Long Beach, Calif. 90806

Filed Feb. 12, 1980, Ser. No. 120,972

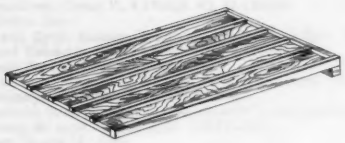
Term of patent 14 years

Int. Cl. D28—*99*

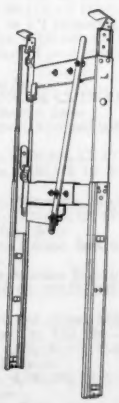
U.S. Cl. D28—99



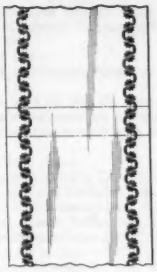
266,281
KITCHEN DRAINBOARD
William H. Ellis, 107 University Pl., New York, N.Y. 10003, and Donald L. Clay, 34 W. 10th St., New York, N.Y. 10011
Filed Mar. 31, 1980, Ser. No. 136,000
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—56



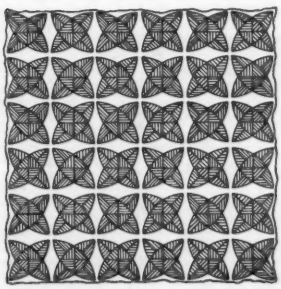
266,282
FRAME FOR IRONING BOARD PROVIDED WITH A CATCH
Dan A. B. Pettersson, Hillerstorp, Sweden, assignor to AB Jarnarmatur, Hillerstorp, Sweden
Filed May 29, 1979, Ser. No. 42,906
Claims priority, application Sweden, Dec. 1, 1978, 78-2817
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—66



266,283
CONTINUOUS SHEET MATERIAL OR THE LIKE
Donald T. Appleman, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jun. 23, 1980, Ser. No. 162,467
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D59—2 B



266,284
FABRIC SHEET OR SIMILAR ARTICLE
William O. Nixon, 31170 Concord, Madison Heights, Mich. 48071
Division of Ser. No. 29,995, Apr. 16, 1979. This application Sep. 30, 1980, Ser. No. 192,462
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1 Q



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF SEPTEMBER, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Abe, Takeshi. Substance with fibrinolytic activity and method of manufacturing the same. 4,350,625, Cl. 260-112.00R.

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Aftergut, Siegfried; and Cole, Herbert S., Jr., to General Electric Company. Novel tris-azo dyes and liquid crystal compositions made therewith. 4,350,603, Cl. 252-299.100.

Agarwala, Poonam; and Zansky, Zoltan, to Honeywell Inc. Two-wire ballast for fluorescent tube dimming. 4,350,933, Cl. 315-278.000.

Agee, John M. Joint prosthesis with improved articulation means. 4,349,922, Cl. 3-1.910.

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Albrecht, Ernst; Hensel, Reiner; Keller, Karl-Heinz; and Stahlschmitt, Horst, to Pfaff Industriemaschinen GmbH. Sewing machine with a device for lubricating the looper. 4,350,105, Cl. 112-256.000.

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Alexandrov, Vyacheslav S.; Guschin, Alexandr E.; Zavodov, Rudolf V.; Zhukova, Elena I.; Ivanov, Alexandr A.; Fofanova, Tatyana S.; Mikhailov, Evgeny I.; Dianov, Ivan M.; Luzin, Pavel M.; Sergeev, Igor A.; Pankratova, Lidia A.; Krylova, Vera E.; and Leibenzon, Semen A. Apparatus for production of fibrous sheet material. 4,350,482, Cl. 425-83.100.

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Allain, Joseph L., Jr. Portable, life monitor, medical instrument. 4,350,164, Cl. 128-639.000.

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Aoki, Shigeru, to Kabushiki Kaisha Suwa Seikosha. Quartz crystal wristwatch. 4,351,040, Cl. 368-88.000.
Aondetto, Bernard, to Sable Freres International. Device for the resilient suspension of a vehicle seat with longitudinal adjustment. 4,350,317, Cl. 248-588.000.
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Barnard, Ralston W.; and Jensen, Dal H., to United States of America, Energy. Method of assaying uranium with prompt fission and thermal neutron borehole logging adjusted by borehole physical characteristics. 4,350,887, Cl. 250-265.000.
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Wicnienski, Michael F., 4,350,441, Cl. 356-40.000.

Bayer Aktiengesellschaft: *See*—
Beck, Gunther; Heitzer, Helmut; and Lurssen, Klaus, 4,350,520, Cl. 71-92.000.

Blank, Heinz U.; Klag, Gunther; and Schnegg, Peter, 4,350,566, Cl. 162-72.000.

Fuchs, Rainer; Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, 4,350,640, Cl. 260-465.00D.

Henrichs, Paul; Haas, Peter; Hoppe, Hans-Georg; and Grimm, Wolfgang, 4,350,777, Cl. 521-110.000.

Kritzler, Helmuth; Bohm, Walter; Kappler, Ulrich; and Winkelmann, Hans D., 4,350,573, Cl. 203-86.000.

Rasshofer, Werner; Grogler, Gerhard; and Meyborg, Holger, 4,350,781, Cl. 521-149.000.

Riebel, Hans-Jochem; Maurer, Fritz; and Priesnitz, Uwe, 4,350,824, Cl. 560-124.000.

Schmidt, Manfred; and Reinking, Klaus, 4,350,793, Cl. 525-133.000.

Bayer, Horst O.; and Swithenbank, Colin, to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-4'-nitrodiphenyl ethers. 4,350,522, Cl. 71-111.000.

BBC Brown, Boveri & Company, Limited: *See*—
Klein, Erwin, 4,350,026, Cl. 62-333.000.

Bear, Michael L. Apparatus for playing a competitive game. 4,350,344, Cl. 273-333.000.

Beck, Gunther; Heitzer, Helmut; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Plant growth regulant compositions. 4,350,520, Cl. 71-92.000.

Beckman Instruments, Inc.: *See*—
Leonian, Armen L., 4,350,283, Cl. 233-26.000.

Beckwith, John R., to Stanford Associates, Inc. Hot water heating system. 4,350,144, Cl. 126-427.000.

Becton, Dickinson and Company: *See*—
Kessler, Stephen B., 4,350,593, Cl. 210-516.000.

Beecham Group Limited: *See*—
Baggaley, Keith H., 4,350,702, Cl. 424-270.000.

Dickinson, Kay H.; Smale, Terence C.; and Southgate, Robert, 4,350,703, Cl. 424-274.000.

Hadley, Michael S.; and Blaney, Frank E., 4,350,691, Cl. 424-244.000.

Begin, David L.: *See*—
Stephenson, George M.; Begin, David L.; Casavant, Roger; Bornemeier, Stephen; and Colucci, William J., 4,350,299, Cl. 239-337.000.

Behrens, Gerhard: *See*—
Heberling, Walter; Muller, Wolfgang; Langenberg, Werner; Behrens, Gerhard; and Saul, Alfred, 4,350,393, Cl. 299-50.000.

Beitner, Shlomo, to Bipol Ltd. Device and process for effecting refrigeration. 4,350,016, Cl. 62-3.000.

Bell Telephone Laboratories, Incorporated: *See*—
Clark, William C.; and Winings, Clifford L., 4,350,404, Cl. 339-97.00R.

Cordell, Robert R., 4,350,904, Cl. 307-310.000.

Belohlawek, Lothar; and Weber, Wolfgang, to Dimalt Aktiengesellschaft. Process for the production of a fine grained multiple lactate and its use as a baking agent. 4,350,716, Cl. 426-626.000.

Belova, Tamara N.: *See*—
Khutoretsky, Garry M.; Tjurin, Jury G.; Drozdova, Larisa A.; and Belova, Tamara N., 4,350,910, Cl. 310-64.000.

Ben-Dor, Yaron. Agricultural implement for the extraction and shredding of stalks and roots. 4,350,207, Cl. 171-58.000.

Bendix Corporation, The: *See*—
Casey, Gary L.; Harvey, Bruce J.; Hebert, Kenneth A.; and Eddy, William C., 4,350,135, Cl. 123-564.000.

Erwin, Louis R.; and Hurlong, Granville W., Jr., 4,350,301, Cl. 239-453.000.

Rodriguez, Celestino, 4,350,939, Cl. 318-592.000.

Benedek, George B.: *See*—
von Schulthess, Gustav K.; Cohen, Richard J.; and Benedek, George B., 4,350,677, Cl. 424-12.000.

Bennes Marrel S.A.: *See*—
Corompt, Antoine, 4,350,469, Cl. 414-420.000.

Benoit-Gonin, Roger; Berger, Jean L.; and Coutures, Jean L., to Thomson-CSF. Charge-transfer coded-voltage generator for use in analog-digital coders and decoders. 4,350,976, Cl. 340-347.0DA.

Benoit, William R. Lighter than air wind energy conversion system utilizing an internal radial disk diffuser. 4,350,896, Cl. 290-55.000.

Benoit, William R. Lighter than air wind energy conversion system. 4,350,897, Cl. 290-55.000.

Benoit, William R. Lighter than air wind energy conversion system utilizing an external radial disk diffuser. 4,350,898, Cl. 290-55.000.

Benoit, William R. Lighter than air wind energy conversion system utilizing a rearwardly mounted internal radial disk diffuser. 4,350,899, Cl. 290-55.000.

Benteler Werke AG: *See*—
Bick, Klaus; Harmsen, Lothar; Zieschang, Jurgen; and Vennmann, Friedhelm, 4,351,055, Cl. 373-76.000.

Bentivegna, Charles R.: *See*—
Heisner, Donald N.; and Bentivegna, Charles R., 4,350,942, Cl. 318-626.000.

Bentley Laboratories: *See*—
Hoffa, Jack, 4,350,157, Cl. 128-214.00R.

Berg, Lennart G. Quick coupling device for pressurized fluid conduits. 4,350,321, Cl. 251-149.600.

Berger, Artur: *See*—
Heinemann, Otto; Schmits, Heinz-Herbert; Philipp, Rainer; and Berger, Artur, 4,350,244, Cl. 198-773.000.

Berger, Jean L.: *See*—
Benoit-Gonin, Roger; Berger, Jean L.; and Coutures, Jean L., 4,350,976, Cl. 340-347.0DA.

Berney, Jean-Claude, to Berney, Jean-Claude. Timepiece with a detector and control circuit for a stepping motor. 4,351,039, Cl. 368-76.000.

Bernier, Edward J., Jr.: *See*—
Hall, Richard A.; and Bernier, Edward J., Jr., 4,350,742, Cl. 428-520.000.

Berry, David A., to RCA Corporation. High density information disc lubricants. 4,351,048, Cl. 369-288.000.

Berry, French J., Jr. Protective pad for backpacks. 4,350,726, Cl. 428-95.000.

Bertens, Theodorus C. J. M., to U.S. Philips Corporation. Dispenser cathode. 4,350,920, Cl. 313-346.00R.

Berton, Marcello; and Bertozzi, Dino, to Ing. C. Olivetti & C., S.p.A. Furniture with space saving door. 4,350,399, Cl. 312-138.00R.

Bertozzi, Dino: *See*—
Berton, Marcello; and Bertozzi, Dino, 4,350,399, Cl. 312-138.00R.

Best, Allan I.; Bohley, Thomas K.; and Westlund, Ronald C., to Hewlett-Packard Company. Time interval measurement apparatus. 4,350,953, Cl. 324-183.000.

Bethlehem Steel Corporation: *See*—
Allegra, Louis K.; Townsend, Herbert E.; and Borzillo, Angelo R., 4,350,540, Cl. 148-31.500.

Torok, Theodore E.; Shin, Paik W.; and Borzillo, Angelo R., 4,350,539, Cl. 148-31.500.

Beyer, Charles L.; and Fox, Billy E. Fireplace damper indicator. 4,350,142, Cl. 126-288.000.

Bianchini, Giuliano, to Societa Italiana Brevetti. Solar collector for heating purposes. 4,350,145, Cl. 126-434.000.

Biax Fiberfilm: *See*—
Hoge, William H., 4,350,655, Cl. 264-145.000.

BICC Limited: *See*—
Seddon, Alan E., 4,350,851, Cl. 191-39.000.

Bick, Klaus; Harmsen, Lothar; Zieschang, Jurgen; and Vennmann, Friedhelm, to Benteler Werke AG. Water cooled wall element formed of tubes for melting furnaces. 4,351,055, Cl. 373-76.000.

Bigot, Bernard; and Gielly, Jean-Francois, to Rhone-Poulenc Industries. Method of preparing phosphoric acid by a wet process. 4,350,671, Cl. 423-320.000.

Binks Manufacturing Company: *See*—
Hetherington, Robert D.; and Goelz, David W., 4,350,266, Cl. 222-40.000.

Binz GmbH & Co.: *See*—
Lehmann, J. C. Ludwig, 4,350,471, Cl. 414-463.000.

Biolik, Felicjan; Lukasik, Adam; Morys, Zagmunt; Walawender, Stanislaw; and Galazka, Szczepan, to Biuro Projektow Przemyslu Metali Niezelaznych "BIPROMET". Electric installation for heating of molten metals and/or salts and solutions. 4,351,057, Cl. 373-117.000.

Bipol Ltd.: *See*—
Beitner, Shlomo, 4,350,016, Cl. 62-3.000.

Bison-Werke Bahre und Greten GmbH & Co. KG: *See*—
Seeger, Gunter; and Wiemann, Dieter, 4,350,484, Cl. 425-140.000.

Bittar, Joseph: *See*— .
Sheehy, George E.; and Bittar, Joseph, 4,350,226, Cl. 187-29.00R.

Bittle, L. Gordon. Automatic feeder for animals. 4,350,120, Cl. 119-51.130.

Bittner, Wilfried: *See—*
Engelsmann, Dieter; Nicko, Reinhard; Bittner, Wilfried; and Karl, Horst, 4,350,423, Cl. 354-173.000.

Biuro Projektow Przemyslu Metali Niezelaznych "BIPROMET": *See—*
Biolik, Felicjan; Lukasik, Adam; Morys, Zagmunt; Walawender, Stanislaw; and Galazka, Szczepan, 4,351,057, Cl. 373-117.000.

Bizerba-Werke Wilhelm Kraut KG: *See—*
Kuhnle, Ernst; and Schwarz, Josef, 4,350,217, Cl. 177-246.000.

Bjorklund, Robert B.: *See—*
Cronauer, Donald C.; and Bjorklund, Robert B., 4,350,609, Cl. 252-465.000.

Blackwell, Jennings P.; and Towers, Richard R., to Phillips Petroleum Company. Organosilane antistatic agents for glass-filled polyarylene sulfides. 4,350,786, Cl. 524-263.000.

Blaha, Alfred; and Schwarzler, Hans-Juergen, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Navigation method for precisely steering a flying object. 4,350,983, Cl. 343-103.000.

Blakeley, James, to International Telephone and Telegraph Corporation. Self-compensation gasket for grooved end pipe couplings. 4,350,350, Cl. 277-207.00A.

Blanch, Paul S.: *See—*
Kovacik, James W.; Kovacik, James D.; Blanch, Thomas J.; and Blanch, Paul S., 4,350,850, Cl. 191-12.20R.

Blanch, Thomas J.: *See—*
Kovacik, James W.; Kovacik, James D.; Blanch, Thomas J.; and Blanch, Paul S., 4,350,850, Cl. 191-12.20R.

Blaney, Frank E.: *See—*
Hadley, Michael S.; and Blaney, Frank E., 4,350,691, Cl. 424-244.000.

Blank, Heinz U.; Klag, Gunther; and Schnegg, Peter, to Bayer Aktiengesellschaft. Process for the delignification of lignocellulose materials with dinitroanthraquinones. 4,350,566, Cl. 162-72.000.

Blasco, Richard W.: *See—*
Haque, Yusuf A.; and Blasco, Richard W., 4,350,975, Cl. 340-347.0CC.

Blase, Helmut; Hogemann, Arend; and Schulze, Dieter, to Harnischfeger GmbH. Telescoping mobile crane. 4,350,255, Cl. 212-268.000.

Blasius, John R.: *See—*
Galer, Richard E.; Blasius, John R.; and Webb, Paul C., 4,350,533, Cl. 106-89.000.

Bloom, Stanley: *See—*
Catanese, Carmen A.; and Bloom, Stanley, 4,350,922, Cl. 313-402.000.

Blount, David H. Process for the production of alkali metal silicate-organic plastics. 4,350,775, Cl. 521-100.000.

Blythe, Robert J.: *See—*
Bond, Robert; and Blythe, Robert J., 4,350,621, Cl. 525-237.000.

Bobb, Clifford F.; and Graeff, Norwood C., to AMP Incorporated. Electrical switch assembly. 4,350,855, Cl. 200-292.000.

Bobowski, George: *See—*
Hoefle, Milton L.; and Bobowski, George, 4,350,704, Cl. 424-274.000.

Bocognano, Rene J. Process for concentrating fluids. 4,350,565, Cl. 159-47.00R.

Bodenseewerk Perkin-Elmer & Co. GmbH: *See—*
Huber, Bernhard, 4,350,718, Cl. 427-181.000.

Boehlke, Klaus: *See—*
Theysohn, Rainer; Boehlke, Klaus; Seiler, Erhard; and Welz, Martin, 4,350,652, Cl. 264-104.000.

Boehringer Ingelheim GmbH: *See—*
Gupte, Arun R.; Kladders, Heinrich; and Struth, Helmut, 4,350,049, Cl. 73-864.510.

Boeing Company, The: *See—*
Michaelson, Gary L., 4,350,551, Cl. 156-245.000.

Bohley, Thomas K.: *See—*
Best, Allan I.; Bohley, Thomas K.; and Westlund, Ronald C., 4,350,953, Cl. 324-183.000.

Bohm, Georg G. A.; Hamed, Gary R.; and Vescelius, Lee E., to Firestone Tire & Rubber Company, The. Thermoplastic elastomer blends. 4,350,795, Cl. 525-194.000.

Bohm, Heinrich: *See—*
Rieber, Norbert; Bohm, Heinrich; Platz, Rolf; and Fuchs, Werner, 4,350,819, Cl. 548-375.000.

Bohm, Walter: *See—*
Kritzler, Helmuth; Bohm, Walter; Kappler, Ulrich; and Winkelmann, Hans D., 4,350,573, Cl. 203-86.000.

Bohn & Dawson: *See—*
Knoche, Raymond E., 4,350,227, Cl. 188-2.00F.

Bohner, Beat; and Rempfler, Hermann, to Ciba-Geigy Corporation. Herbicidal α-[4-(3',5'-dichloropyrid-2'-yl)-oxy]-phenoxy-propionic acid γ-butyrolactone ester and thioester. 4,350,521, Cl. 71-94.000.

Boiko, Vitaly T.: *See—*
Antipov, Georgy A.; Gelfand, Mikhail L.; Tsipenjuk, Yakov I.; Goldshtein, Boris G.; Lavnikov, Nikolai S.; Teres, Leonid N.; Urazhdin, Ivan I.; Yakubovsky, Petr S.; Boiko, Vitaly T.; Kalmykov, Anatoly M.; Minyashkin, Dmitry P.; and Stepanov, Mikhail M., 4,350,213, Cl. 173-93.600.

Bolsing, Friedrich. Process for even division of substances and mixtures of substances in the course of manufacturing of pulverulent preparations by chemical reaction. 4,350,598, Cl. 210-751.000.

Bolten, Michael; and Carpenter, Henry L., to Woma Corporation. Plant for cleaning castings and the like. 4,350,174, Cl. 134-104.000.

Bond, Robert; and Blythe, Robert J., to Dunlop Limited. Elastomer compositions for tire tread. 4,350,621, Cl. 525-237.000.

Bonnet, Alain, to Saint Gobain Industries. Apparatus for the continuous production of building elements having cellular cores. 4,350,483, Cl. 425-115.000.

Bonu, Bonu, to Siemens Aktiengesellschaft. Method of etching semiconductor wafers on one side. 4,350,562, Cl. 156-639.000.

Borchard, Heinz: *See—*
Redlich, Horst; Borchard, Heinz; and Ihlenburg, Rainer, 4,351,047, Cl. 369-270.000.

Borchert, Werner: *See—*
Schulz, Adalbert; and Borchert, Werner, 4,350,202, Cl. 165-95.000.

Borg, David G.: *See—*
Bowman, Arthur F.; and Borg, David G., 4,350,097, Cl. 102-275.200.

Borg-Warner Corporation: *See—*
Miller, Alan L.; and Ivey, John S., 4,350,058, Cl. 74-866.000.

Bornemeier, Stephen: *See—*
Stephenson, George M.; Begin, David L.; Casavant, Roger; Bornemeier, Stephen; and Colucci, William J., 4,350,299, Cl. 239-337.000.

Borschneck, Anthony G. Splint for use with a human leg. 4,350,153, Cl. 128-84.00C.

Borzillo, Angelo R.: *See—*
Allegra, Louis K.; Townsend, Herbert E.; and Borzillo, Angelo R., 4,350,540, Cl. 148-31.500.
Torok, Theodore E.; Shin, Paik W.; and Borzillo, Angelo R., 4,350,539, Cl. 148-31.500.

Bottka, Nicholas; and Lessoff, Howard, to United States of America, Navy. Multi-color tunable filter. 4,350,413, Cl. 350-356.000.

Boudot, Bernard; and Nury, Georges, to Rhone-Poulenc Industries. Process for the manufacture of polycrystalline garnet and corresponding monocrystals. 4,350,558, Cl. 156-617.0SP.

Boudot, Bernard; and Nury, Georges, to Rhone-Poulenc Industries. Process for the manufacture of polycrystalline garnet and corresponding monocrystal. 4,350,559, Cl. 156-617.0SP.

Boudy, Jean-Pierre, to Renault Sport. Fuel flow control supercharged engine. 4,350,128, Cl. 123-369.000.

Bourdeau, Romeo G.: *See—*
Layden, George K., Jr.; Bourdeau, Romeo G.; and Pike, Roscoe A., 4,350,672, Cl. 423-445.000.

Bourgy, Gerard: *See—*
Pardon, Pierre; Lantier, Frederic; Marly, Jose; and Bourgy, Gerard, 4,350,684, Cl. 424-92.000.

Bourke, Patrick T. Method and apparatus for cutting stone panels. 4,350,552, Cl. 156-254.000.

Boussert, Anne S., to Dow Chemical Company, The. Method of making catalysts for the production of ethylene oxide. 4,350,616, Cl. 252-463.000.

Bowden, Donald R., to Solar Unlimited, Inc. Heat exchanger and method of making. 4,349,950, Cl. 29-157.3AH.

Bowen, Kenneth S., to Bowens Sales and Service Limited. Front projection photographic apparatus. 4,350,419, Cl. 354-110.000.

Bowen, Robert F.: *See—*
Dudley, Kenneth W.; Teich, Wesley W.; and Bowen, Robert F., 4,350,859, Cl. 219-10.55F.

Bowens Sales and Service Limited: *See—*
Bowen, Kenneth S., 4,350,419, Cl. 354-110.000.

Bowman, Arthur F.; and Borg, David G., to Atlas Powder Company. Nonelectric delay detonator with tubular connecting arrangement. 4,350,097, Cl. 102-275.200.

Bowyer, William H.: *See—*
Knight, Lindsay C.; Phillips, Robert B.; Bowyer, William H.; and Moxley, Bruce, 4,350,881, Cl. 235-400.000.

Boyce, William D., II. Laterally and vertically controllable underwater towed vehicle. 4,350,111, Cl. 114-245.000.

Bradley, John J.; and Franklin, Benjamin S., to Honeywell Information Systems Inc. Switch system base mechanism. 4,351,024, Cl. 364-200.000.

Brain, Sally A.: *See—*
Robinson, Joseph G.; and Brain, Sally A., 4,350,623, Cl. 524-391.000.

Brand, Uwe: *See—*
Fuchs, Hugo; Brand, Uwe; Deuker, Ernst; and Frommer, Elmar, 4,350,630, Cl. 260-239.30A.

Branson Ultrasonics Corporation: *See—*
Summo, Arthur M., 4,350,649, Cl. 264-23.000.

Braun, Oskar, to Josef Willmes GmbH. Fruit juice press. 4,350,089, Cl. 100-116.000.

Brecker, James N.: *See—*
Maxey, Robert E. L.; and Brecker, James N., 4,351,029, Cl. 364-511.000.

Breidbach, Josef: *See—*
Hermann, Joerg; Baier, Werner; and Breidbach, Josef, 4,350,288, Cl. 237-12.30C.

Bremer, Noel J.: *See—*
Lemanski, Michael F.; Bremer, Noel J.; and Milberger, Ernest C., 4,350,611, Cl. 252-435.000.
Milberger, Ernest C.; Bremer, Noel J.; and Dria, Dennis E., 4,350,639, Cl. 549-259.000.

Brewer, John C., to Garbalizer Corp. of America. Shredding machine and components thereof. 4,350,308, Cl. 241-294.000.

Bricaud, Herve: *See—*
Seytre, Bruno; and Bricaud, Herve, 4,350,403, Cl. 339-91.00R.

Bridgestone Tire Company Limited: *See*—
Matsuda, Akira; Havakawa, Yoshihiro; Yasuda, Shigeo; Iwasaki, Motoaki; and Nishino, Hiroshi, 4,350,854, Cl. 200-61.250.
Bristol Myers Company: *See*—
Tihon, Claude; and Curry, M. E., 4,350,768, Cl. 435-241.000.
British Aerospace: *See*—
Thomas, Ernest D. R., 4,350,316, Cl. 244-63.000.
Brodribb, Antony G.: *See*—
Brodribb, Marcus T.; and Brodribb, Antony G., 4,349,977, Cl. 43-15.000.
Brodribb, Marcus T.; and Brodribb, Antony G., to King Reel Proprietary Limited. Automatic fishing apparatus. 4,349,977, Cl. 43-15.000.
Brollo, Aurelio, to Industrie Pirelli S.p.A. Header for solar-panels and a device for connecting header to panel. 4,350,374, Cl. 285-132.000.
Bromley, Robert L., to Samsonite Corporation. Luggage case resettable sequential combination lock. 4,350,030, Cl. 70-70.000.
Broshear, John H.: *See*—
Kneip, George D.; Broshear, John H.; and Anderson, Marvin H., 4,350,017, Cl. 62-50.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Hirose, Noboru, 4,350,212, Cl. 173-6.000.
Brothers, Richard L. Anchor bolt for concrete. 4,350,464, Cl. 411-180.000.
Broutman, Lawrence J.; Rozhansky, Boris; and Zlatkevich, Lev. Chemiluminescence apparatus and method for determining the oxidative stability of polymers. 4,350,495, Cl. 23-230.0PC.
Brouwer, Marius S.; and Grosscurt, Arnoldus C., to Duphar International Research B.V. Urea and thiourea compounds and insecticidal compositions. 4,350,706, Cl. 424-322.000.
Brown, Charles K. Bag unit feeder. 4,350,330, Cl. 271-12.000.
Brown, Richard C.: *See*—
Greenough, George K.; and Brown, Richard C., 4,350,507, Cl. 55-270.000.
Brown, William L., to Kline, Larry Harold. Universal golf bag. 4,350,194, Cl. 150-1.50C.
Brownett, Robert L., to Dunlop Limited. Anti-reversal device. 4,350,235, Cl. 192-45.000.
Bruce, Walter J., Jr.; and Bruce, Wayne M., to Bruce's Splicing & Rigging Co., Inc. Shellfish dredge chafing gear. 4,349,972, Cl. 37-55.000.
Bruce, Wayne M.: *See*—
Bruce, Walter J., Jr.; and Bruce, Wayne M., 4,349,972, Cl. 37-55.000.
Bruce's Splicing & Rigging Co., Inc.: *See*—
Bruce, Walter J., Jr.; and Bruce, Wayne M., 4,349,972, Cl. 37-55.000.
Bruguera, Ramon, to Patentes Y Novedades, S.A. Urea/formaldehyde adhesives. 4,350,543, Cl. 156-62.800.
Brunner, Josef: *See*—
Rock, Erich; and Brunner, Josef, 4,349,941, Cl. 16-288.000.
Bryant, Peter E. Structural members. 4,350,459, Cl. 403-263.000.
Buchanan, David J.; and Mason, Iain M., to Coal Industry (Patents) Limited. Method of and apparatus for locating disturbances in a mineral seam. 4,351,035, Cl. 367-14.000.
Buckley, William H., to United States of America, Navy. Structural damper for eliminating wind induced vibrations. 4,350,233, Cl. 188-378.000.
Buffalo Color Corporation: *See*—
Demler, Walter R.; and Odin, Eugene, 4,350,827, Cl. 562-475.000.
Bunker Ramo Corporation: *See*—
Kato, Matsuo; Ohtsuki, Tomonari; Igarashi, Yoshiaki; Saito, Tsukasa; and Suzuki, Toshiaki, 4,350,409, Cl. 339-186.00M.
Bunn, Stuart E.; and Owsley, Herbert B. Valve assembly with relief groove. 4,350,179, Cl. 137-540.000.
Burch, Jeremy R.; and Murray, David E., to Vickers Limited. Processing of radiation sensitive plates. 4,350,756, Cl. 430-331.000.
Burnett, Archibald L: *See*—
Jones, David N.; Burnett, Archibald L; and Milier, John C., 4,350,657, Cl. 264-349.000.
Burnett, Edward L.; and Stack, Eugene V., to Dow Chemical Company, The. Method for the extrusion of tetrafluoroethylene polymer tubes. 4,350,653, Cl. 264-127.000.
Burns, Derek K.: *See*—
Robinson, Grenville A.; Kember, Peter N.; and Burns, Derek K., 4,350,660, Cl. 422-90.000.
Burns, Marion C.: *See*—
Davis, Raymond K., Sr.; and Burns, Marion C., 4,350,871, Cl. 219-343.000.
Burroughs Corporation: *See*—
Jasper, William J., 4,350,951, Cl. 324-133.000.
Burton, Stephen J., to Emerson Electric Co. Wick lubrication system for self-aligning bearing. 4,350,912, Cl. 310-90.000.
Busche, Alan C.; and Simonsen, Karlo B., to Northern Telecom Limited. Acoustic mounting and coupler for a telephone handset. 4,350,846, Cl. 179-1.00C.
Buschmann, Ernst: *See*—
Sauter, Hubert; Zeeh, Bernd; Buschmann, Ernst; and Jung, Johann, 4,350,518, Cl. 71-88.000.
Bush, Charles J., to New York City Transit Authority. Resilient rail fastener assembly for curved track. 4,350,290, Cl. 238-17.000.
Busse, Vernon E.; and Schockman, Robert L., to Minster Machine Company, The. Motorized and micro feed length adjustment for a press feed. 4,350,090, Cl. 100-216.000.
C. Uyemura & Co., Ltd.: *See*—
Araki, Ken; Sakai, Hiromitsu; and Sugiura, Yutaka, 4,350,717, Cl. 427-8.000.
Caldwell, Joseph M. Axially-split archery bow limb. 4,350,138, Cl. 124-24.00R.
Campbell, Paul K.; and Nichols, Edward L., III, to Square D Company. Method and system for crimping a metal connector. 4,350,843, Cl. 174-94.00R.
Canadian Patents & Dev. Limited: *See*—
Feher, Kamilo, 4,350,879, Cl. 235-92.0EC.
Cannavo, Christian G.; Couain, Georges; Espagnacq, Andre; Frayssac, Jacques X.; Laine, Loic Y.; Midrouillet, Daniel J.; Pintenat, Andre M.; and Reboux, Jean B., to Etat Francais represente par le Delegation General pour l'Armement. Electric device for the ignition by magnetic induction of a pyrotechnic substance. 4,350,096, Cl. 102-209.000.
Canon Kabushiki Kaisha: *See*—
Hanagata, Takayoshi; and Noda, Atsushi, 4,350,448, Cl. 400-120.000.
Hanagata, Takayoshi; and Noda, Atsushi, 4,350,987, Cl. 346-76.0PH.
Imai, Nobuhiro; Kono, Kimio; Hoshito, Kazuo; Kiyohara, Takehiko; and Sato, Hideaki, 4,351,005, Cl. 358-300.000.
Iwashita, Tomonori; and Fukushima, Tadahide, 4,350,424, Cl. 354-173.000.
Masegi, Koichi, 4,350,988, Cl. 346-108.000.
Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; Tsunoda, Atsuo; Midorikawa, Koyo; Murase, Hidetoshi; Suzuta, Mikio; and Moriwaki, Masazumi, 4,350,431, Cl. 355-1.000.
Noda, Atsushi, 4,350,456, Cl. 400-344.000.
Seto, Susumu; Tokuhara, Mitsuhiro; Takemura, Yukio; Yamada, Yu; and Kuwayama, Takeshi, 4,350,433, Cl. 355-8.000.
Taguchi, Tetsuya; Tamura, Shuichi; Tokuda, Ryuji; and Ogawa, Masahiko, 4,350,418, Cl. 354-25.000.
Tanioka, Hiroshi; Ishida, Masato; and Inuzuka, Tsuneki, 4,350,439, Cl. 355-14.0SH.
Watanabe, Tsuyoshi, 4,350,440, Cl. 355-3.0DD.
Yagasaki, Toshiaki; Masuda, Shunichi; Shimizu, Katsuichi; and Sakamaki, Hisashi, 4,350,436, Cl. 355-14.0SH.
Cantrell, Mark: *See*—
Hopkins, Grant; and Cantrell, Mark, 4,350,252, Cl. 211-40.000.
Canyon Corporation: *See*—
Tada, Tetsuya, 4,350,298, Cl. 239-333.000.
Capewell, Dennis: *See*—
Spira, Joel S.; Lucheco, David G.; and Capewell, Dennis, 4,350,935, Cl. 315-291.000.
Carle, Joseph T.: *See*—
Wilson, Brown L.; and Carle, Joseph T., 4,350,911, Cl. 310-87.000.
Carman, Vincent E., to Advanced Energy Systems Inc. Automotive drive system. 4,350,220, Cl. 180-165.000.
Carmer, Richard V.: *See*—
Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., 4,350,737, Cl. 428-383.000.
Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., 4,350,738, Cl. 428-383.000.
Carnahan, G. E. Golf ball washer and club cleaner. 4,350,457, Cl. 401-11.000.
Carpenter, Henry L.: *See*—
Bolten, Michael; and Carpenter, Henry L., 4,350,174, Cl. 134-104.000.
Carpenter, Richard H.: *See*—
Jarrell, Donald, 4,350,587, Cl. 210-151.000.
Carrens, Donald E., to Dresser Industries, Inc. Pump piston having ring lubrication means. 4,350,082, Cl. 92-159.000.
Carrier Corporation: *See*—
Jackson, Dale E., 4,350,936, Cl. 318-7.000.
Carter, Robert W.: *See*—
Wald, Stephen A.; and Carter, Robert W., 4,350,727, Cl. 428-102.000.
Cartossi, Ferdinando, to AMC International Alfa Metalcraft Corporation S.A. Stainless steel container with thermoradiating bottom. 4,350,259, Cl. 220-66.000.
Casavant, Roger: *See*—
Stephenson, George M.; Begin, David L.; Casavant, Roger; Bornemeier, Stephen; and Colucci, William J., 4,350,299, Cl. 239-337.000.
Casey, Gary L.; Harvey, Bruce J.; Hebert, Kenneth A.; and Eddy, William C., to Bendix Corporation, The. Supercharging system for an internal combustion engine. 4,350,135, Cl. 123-564.000.
Castellucci, Nicholas T.: *See*—
Ostrowski, John S.; Grunewalder, John F.; and Castellucci, Nicholas T., 4,350,804, Cl. 525-327.300.
Caston, Alfred W. H. Visual filing system for gems, jewelry items, small parts and the like. 4,350,249, Cl. 206-566.000.
Catanese, Carmen A.; and Bloom, Stanley, to RCA Corporation. Multicolor cathode-ray tube with quadrupolar focusing color-selection structure. 4,350,922, Cl. 313-402.000.
Caterpillar Tractor Co.: *See*—
King, Dennis M., 4,350,127, Cl. 123-364.000.
Waddell, Bennett N.; Warren, Larry G.; and Wilson, Eugene M., 4,350,363, Cl. 280-481.000.
Central Quality Industries, Inc.: *See*—
McCambridge, James; and Hettinga, Siebolt, 4,350,193, Cl. 144-286.00R.
Centro Ricerche Fiat S.p.A.: *See*—
Dotti, Giulio; and Masoero, Renzo, 4,350,354, Cl. 280-6.00H.
Century 21 Pollution Control, Inc.: *See*—
Diachuk, Wolodymyr, 4,350,504, Cl. 55-217.000.

Cereghini, Giuseppe, to Euro-Linea S.n.c. di Colombo & C. Method for admixing at least two liquids and feeding them to a shaping mould. 4,350,650, Cl. 264-39.000.

Chable, Yves A.; Lacroix, Serge; and Rault, Philippe M., to Societe Anonyme de Telecommunications. Hyperthermic treatment device. 4,350,168, Cl. 128-736.000.

Chalberg, Philip E. Jet nozzle assembly for therapy baths. 4,349,923, Cl. 4-542.000.

Challen, Richard F., to General Electric Company. Frequency sensing circuit. 4,351,032, Cl. 364-724.000.

Chambers, Carlon C. Measuring the aromatic reactivity of a hydrocarbon composition. 4,350,496, Cl. 23-230.00M.

Chambers, Charles W., Jr., to Tellabs, Inc. Impedance generator circuit. 4,350,964, Cl. 333-213.000.

Chambers, Kenneth R. Auxiliary power source for starting a motor vehicle. 4,350,746, Cl. 429-121.000.

Chan, David C. K.; and Whipp, Arthur A., to Chevron Research Company. Miticidal and mite ovicidal, compounds. 4,350,831, Cl. 564-80.000.

Chane Hwa Manufacturing Co. Ltd.: *See*—
Tong, George K. K., 4,350,407, Cl. 339-113.00L.

Charles, Joel M.; and Toscano, Robert J., to Etat Francais as represented by the Delegue General pour l'Armement. Device for recovery of a cable for handling a submerged load. 4,350,323, Cl. 254-273.000.

Chartier, Carl P.: *See*—
Helgeland, Walter; Teverovsky, Alex; Kerwin, Kenneth H., II; and Chartier, Carl P., 4,350,560, Cl. 156-617.0SP.

Chattha, Mohinder S., to Ford Motor Company. Composition with latent reactive catalyst. 4,350,790, Cl. 525-110.000.

Chausse, Bernard: *See*—
Pouillange, Jean P.; Gaydon, Jean P.; and Chausse, Bernard, 4,350,861, Cl. 219-10.61R.

Chavis, Thurston L., Jr.: *See*—
Watkins, William L., III; Chavis, Thurston L., Jr.; and Fuchsluger, George L., 4,350,648, Cl. 261-120.000.

Chenoweth, Vaughn C.: *See*—
Faulkner, Duane H.; and Chenoweth, Vaughn C., 4,350,516, Cl. 65-327.000.

Chester, Arthur W.; and Chu, Yung F., to Mobil Oil Corporation. Process for converting ethane to aromatics over gallium-activated zeolite. 4,350,835, Cl. 585-415.000.

Chevron Research Company: *See*—
Chan, David C. K.; and Whipp, Arthur A., 4,350,831, Cl. 564-80.000.
Rosenthal, Joel W.; Dahlberg, Arthur J.; and Kuehler, Christopher W., 4,350,582, Cl. 208-8.0LE.

Chiba, Toshiyuki: *See*—
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tozuka, Zenzaburo, 4,350,693, Cl. 424-246.000.

Chibata, Ichiro; Kato, Jyoji; and Wada, Mitsuru, to Tanabe Seiyaku Co., Ltd. Method for producing ethanol with immobilized microorganism. 4,350,765, Cl. 435-161.000.

Chika, John J. Vehicle occupant restraining devices. 4,350,369, Cl. 280-804.000.

Childress, David L.; Hayes, William V.; and Poppe, Richard L., to Dow Chemical Co., The. Method for making acrylic acid from acrolein. 4,350,830, Cl. 562-535.000.

Chimura, Kozo: *See*—
Ogihara, Masuo; Chimura, Kozo; and Shinozaki, Nobuo, 4,351,043, Cl. 368-252.000.

Choate, William C.; and Ho, David S., to Texas Instruments Incorporated. CCD Imager. 4,351,004, Cl. 358-213.000.

Chocas, William, to W. R. Grace & Co. Gas expansion/compression train. 4,350,019, Cl. 62-87.000.

Chow, Chao-Kong; Liu, Chao-Ning; and Wang, Sherman S., to International Business Machines Corporation. Apparatus and method for characterizing an acoustic field. 4,350,045, Cl. 73-607.000.

Chowdhury, Ajit K., to Sterling Drug Inc. Process for treatment of caustic waste liquors. 4,350,599, Cl. 210-761.000.

Christensen, Burton G.; and Shih, David H., to Merck & Co., Inc. 6- and 4-Substituted-1-azabicyclo[3.2.0]heptan-3,7-dione-2-carboxylates. 4,350,631, Cl. 260-245.20T.

Chu, Yung F.: *See*—
Chester, Arthur W.; and Chu, Yung F., 4,350,835, Cl. 585-415.000.

Chubb, Wayne L. Key attachment. 4,349,975, Cl. 40-330.000.

Ciba-Geigy Corporation: *See*—
Bohner, Beat; and Rempfler, Hermann, 4,350,521, Cl. 71-94.000.
Durr, Dieter, 4,350,519, Cl. 71-88.000.
Scheidegger, Hans; Flensberg, Hermann; and Bauhofer, Roland, 4,350,494, Cl. 8-636.000.

Cibie Projecteurs: *See*—
Fratty, Hector, 4,351,018, Cl. 362-215.000.

Cinderella AB: *See*—
Moll, Thorleif, 4,350,024, Cl. 62-238.600.

Citizen Watch Co., Ltd.: *See*—
Fukutome, Satoru; Hatanaka, Hideo; and Saito, Motoyuki, 4,351,041, Cl. 368-88.000.

Clarion Company, Ltd.: *See*—
Kariya, Masatane; and Tomizawa, Akimori, 4,350,848, Cl. 179-2.0DP.

Clark, Donald C.: *See*—
Liska, Donald J.; Schamaun, Roger G.; Clark, Donald C.; Potter, R. Christopher; and Frank, Joseph A., 4,350,921, Cl. 313-360.100.

Clark, Stephan R. Spectrovoltaic solar energy conversion system. 4,350,837, Cl. 136-246.000.

Clark, William C.; and Winings, Clifford L., to Bell Telephone Laboratories, Incorporated. Electrical connector construction. 4,350,404, Cl. 339-97.00R.

Clement, Carl J.: *See*—
Schwartz, Henry D.; Krull, Irwin H.; Clement, Carl J.; Stengel, Frederick H.; and Hayslett, David D., 4,350,579, Cl. 204-195.00R.

Clements-Jewery, Stephen; Westwood, Robert; and Hairsine, Peter W., to Roussel Uclaf. Antidepressant and neuroleptic benzothiopyrano [2,3-c]-pyridines. 4,350,697, Cl. 424-256.000.

Cleveland Clinic Foundation: *See*—
Sivak, Michael V., Jr.; and Skipper, George J., 4,350,148, Cl. 128-4.000.

Clough, Peter; and Walker, Donald C. B., deceased (by Walker, Eileen F., Administratrix), to United Kingdom Atomic Energy Authority. Method of and apparatus for storing data signals. 4,351,006, Cl. 360-9.000.

Coal Industry (Patents) Limited: *See*—
Buchanan, David J.; and Mason, Iain M., 4,351,035, Cl. 367-14.000.
Robinson, Joseph G.; and Brain, Sally A., 4,350,623, Cl. 524-391.000.

Cohen, Richard J.: *See*—
von Schulthess, Gustav K.; Cohen, Richard J.; and Benedek, George B., 4,350,677, Cl. 424-12.000.

Colamco, Inc.: *See*—
Hammond, James A., 4,350,734, Cl. 428-308.400.

Cole, Herbert S., Jr.: *See*—
Aftergut, Siegfried; and Cole, Herbert S., Jr., 4,350,603, Cl. 252-299.100.

Cole, John L.: *See*—
Scholl, Richard A.; and Cole, John L., 4,350,557, Cl. 156-601.000.

Coleman, David L., to Deere & Company. Fail-safe brake linkage. 4,350,237, Cl. 192-116.500.

Coleman, William E.; and Hall, Stacy W., to NCR Corporation. Method of plasma panel drive to reduce flash and create dimming. 4,350,932, Cl. 315-169.200.

Colgate-Palmolive Company: *See*—
Harvey, Kenneth; Hayes, Harry; and Morton, Anthony J., 4,350,680, Cl. 424-52.000.

Colortex S.A.: *See*—
van Hoorn, Jacques J. B., 4,350,305, Cl. 241-46.00B.

Colortronic Reinhard & Co. KG: *See*—
Hellmann, Wolf D., 4,350,381, Cl. 294-88.000.

Colucci, William J.: *See*—
Stephenson, George M.; Begin, David L.; Casavant, Roger; Bornemeier, Stephen; and Colucci, William J., 4,350,299, Cl. 239-337.000.

Compagnie Electro-Mecanique: *See*—
Pouillange, Jean P.; Gaydon, Jean P.; and Chausse, Bernard, 4,350,861, Cl. 219-10.61R.

Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See*—
Dupont, Jean, 4,350,940, Cl. 318-603.000.
Lazzari, Jean-Pierre, 4,350,743, Cl. 428-622.000.

Compak Systems, Inc.: *See*—
Penick, Ib; and Volkert, John K., 4,349,973, Cl. 40-124.100.

Concordia Fluidtechnik GmbH: *See*—
Stahle, Kurt, 4,350,320, Cl. 251-129.000.

Condon, Charles E., Jr.: *See*—
Cornish, Paul M.; and Condon, Charles E., Jr., 4,350,397, Cl. 308-212.000.

Conlon, Ralph D.; Miles, Stanley F.; and Paradis, Roland C., to Perkin-Elmer Corporation, The. Apparatus useful with a chromatography column. 4,350,586, Cl. 210-149.000.

Conometer Corporation: *See*—
Holben, Eugene F., 4,350,285, Cl. 236-1.00R.

Conrad, Lawrence H., to Minnesota Mining & Manufacturing Company. Auxiliary lens system for overhead projectors. 4,350,415, Cl. 350-422.000.

Continental Group, Inc., The: *See*—
Roth, Donald J., 4,350,261, Cl. 220-270.000.

Contois, Lawrence E., to Eastman Kodak Company. High resolution heterogeneous photoconductive compositions and method of preparing. 4,350,751, Cl. 430-135.000.

Cook, Albert N., to Singer Company, The. Sewing machine motor mount. 4,350,104, Cl. 112-220.000.

Cook, Gregory E., to Windpowered Machines Ltd. Wind turbine and method for power generation. 4,350,895, Cl. 290-55.000.

Cooper, Richard K.: *See*—
Jackson, Jasper A.; and Cooper, Richard K., 4,350,955, Cl. 324-303.000.

Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Modified olefin polymers. 4,350,740, Cl. 428-461.000.

Cordell, Robert R., to Bell Telephone Laboratories, Incorporated. Current source with modified temperature coefficient. 4,350,904, Cl. 307-310.000.

Corea, Emanuel R.: *See*—
Corea, John E.; Corea, Emanuel R.; and Tashlick, Irving, 4,350,481, Cl. 425-73.000.

Corea, John E.; Corea, Emanuel R.; and Tashlick, Irving. Apparatus for centrifugal casting of thermosetting plastics. 4,350,481, Cl. 425-73.000.

Corning Glass Works: *See*—
Riceberg, Louis J., 4,350,659, Cl. 422-61.000.

Cornish, Paul M.; and Condon, Charles E., Jr., to Torrington Company, The. Low strength material housing bearing. 4,350,397, Cl. 308-212.000.

Corompt, Antoine, to Bennes Marrel S.A. Handling device mounted on a vehicle to carry out the handling of loads such as skips and containers. 4,350,469, Cl. 414-420.000.

Cosmos Company Limited: *See—*
Tsuiki, Tadanobu, 4,350,239, Cl. 194-1.00G.

Coucoulas, Alexander; and Spainhour, Carroll D., to Western Electric Company, Inc. Method and apparatus for extruding glass tubes. 4,350,513, Cl. 65-29.000.

Couennault, Pierre; and Teyssier, Lucien, to Thomson-CSF. Crossed field re-entrant beam amplifier. 4,350,928, Cl. 315-39.300.

Coufal, Edward J. Adjustable pattern cultivator. 4,350,211, Cl. 172-311.000.

Coulter Electronics, Inc.: *See—*
Gilbert, Ian D.; Halloran, Michael T.; and Roos, Ermi, 4,350,292, Cl. 239-7.000.

Countryman, Gerald P.; and Findlay, Ronald G., to International Business Machines Corporation. Resistive ribbon printing apparatus and method. 4,350,449, Cl. 400-120.000.

Cousin, Georges: *See—*
Cannavo, Christian G.; Cousin, Georges; Espagnacq, Andre; Frayssac, Jacques X.; Laine, Loic Y.; Midrouillet, Daniel J.; Pintenat, Andre M.; and Reboux, Jean B., 4,350,096, Cl. 102-209.000.

Coutures, Jean L.: *See—*
Benoit-Gonin, Roger; Berger, Jean L.; and Coutures, Jean L., 4,350,976, Cl. 340-347.0DA.

Covert, William J., to Garvey Corporation. Carton inspecting and conveying apparatus. 4,349,998, Cl. 53-53.000.

Cox, Nigel B., to Halifax Tool Company Limited. Sealing of telescopically related elements. 4,350,348, Cl. 277-199.000.

Coyle, Peter J.: *See—*
Crouthamel, Marvin S.; and Coyle, Peter J., 4,350,836, Cl. 136-244.000.

Craft, Inc.: *See—*
Roy, Leo T., 4,349,942, Cl. 16-376.000.

Crain, Philip W.: *See—*
Kilroy, Eugene J.; Kelley, William J.; and Crain, Philip W., 4,349,983, Cl. 46-12.000.

Crastes de Paulet, Andre: *See—*
Nicolas, Jean-Claude; Terouanne, Beatrice; Descomps, Bernard; and Crastes de Paulet, Andre, 4,350,760, Cl. 435-7.000.

Crepaco, Inc.: *See—*
Kristapovich, Paul J.; and Knapp, Milton E., 4,350,022, Cl. 62-174.000.

Cressington Investments Ltd.: *See—*
Kumana, Cyrus R., 4,350,690, Cl. 424-243.000.

Crittenden, Odell D. Tension control system. 4,350,180, Cl. 137-596.170.

Cronauer, Donald C.; and Bjorklund, Robert B., to Gulf Research & Development Company. Process for producing a catalyst by depositing molybdenum removed from a waste catalyst. 4,350,609, Cl. 252-465.000.

Croseck, Hans-Henning; and Jung, Rolf, to Laeis-Werke AG. Press for ceramic moldings. 4,350,486, Cl. 425-412.000.

Cross, Peter E.; and Dickinson, Roger P., to Pfizer Inc. Imidazole derivatives, process for their preparation and pharmaceutical compositions thereof. 4,350,696, Cl. 424-251.000.

Crossman, Richard L.; and Kirk, Richard L., to Goodyear Aerospace Corporation. Friction wear pad and method and means for fastening said pad to a disk core member. 4,350,231, Cl. 188-218.0XL.

Crothers, William R. Cart. 4,350,356, Cl. 280-47.260.

Crouthamel, Marvin S.; and Coyle, Peter J., to United States of America, Energy. Solar array construction. 4,350,836, Cl. 136-244.000.

CSR Limited: *See—*
Moorehead, David R.; and Davis, Michael, 4,350,567, Cl. 162-145.000.

Cuisia, Dionisio G.; and Hwa, Chih M., to Dearborn Chemical Company. Composition and method for inhibiting corrosion. 4,350,606, Cl. 252-392.000.

Curiger, Karl: *See—*
Gasser, Hermann; Curiger, Karl; and Novak, Peter, 4,350,007, Cl. 57-304.000.

Curry, M. E.: *See—*
Tihon, Claude; and Curry, M. E., 4,350,768, Cl. 435-241.000.

Cyr, Stephen J.; Schubert, John C.; and Dehlinger, John, to Standard Oil Company (Indiana). Plastic laminate. 4,350,730, Cl. 428-215.000.

Czenkusz, Bernard: *See—*
Richardson, Roy; and Czenkusz, Bernard, 4,350,044, Cl. 73-600.000.

d'Achon, Herve. Machine for converting thermal energy into work. 4,350,015, Cl. 60-675.000.

Dahlberg, Arthur J.: *See—*
Rosenthal, Joel W.; Dahlberg, Arthur J.; and Kuehler, Christopher W., 4,350,582, Cl. 208-8.0LE.

Daigaku, Masaaki: *See—*
Osada, Hajime; Kimura, Akiteru; Shimizu, Tokuo; Kitajima, Goro; Tomizawa, Yoshio; Kondo, Makoto; Motoyama, Kazuyasu; and Daigaku, Masaaki, 4,351,009, Cl. 360-105.000.

Daimaru, Akimasa: *See—*
Ban, Keisuke; and Daimaru, Akimasa, 4,350,056, Cl. 74-579.00E.

Daimler-Benz Aktiengesellschaft: *See—*
Holzapfel, Immanuel, 4,350,009, Cl. 60-39.230.
Vester, Ewald; Grussaber, Rolf; Kupper, Wolfgang; and Glatzhofer, Horst, 4,349,964, Cl. 33-264.000.

Dainippon Printing Company Ltd.: *See—*
Hayasaka, Yoshiyuki; Ikeuchi, Ichiro; Matsumoto, Hajime; and Shikaya, Yukihiro, 4,349,997, Cl. 53-51.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Yamada, Mitsuhiko, 4,350,997, Cl. 358-78.000.

Dakin, James T., to General Electric Company. Liquid cooled counter flow turbine bucket. 4,350,473, Cl. 416-1.000.

Dalupan, Romulo V. High efficiency water distillation apparatus. 4,350,568, Cl. 202-180.000.

Darley, Kenneth S.: *See—*
Dyson, David V.; Lees, David H.; Fenn, Michael A. F.; and Darley, Kenneth S., 4,350,713, Cl. 426-243.000.

Darnell, William R.: *See—*
Jackson, Winston J., Jr.; and Darnell, William R., 4,350,805, Cl. 528-271.000.

Davis, Laurance B. Dental pulp tester. 4,350,488, Cl. 433-32.000.

Davis, Michael, to Airway Industries, Inc. Method of making a cover for a luggage case. 4,350,546, Cl. 156-93.000.

Davis, Michael: *See—*
Moorehead, David R.; and Davis, Michael, 4,350,567, Cl. 162-145.000.

Davis, Raymond K., Sr.; and Burns, Marion C. Horizontal passively cooled heater. 4,350,871, Cl. 219-343.000.

Davis, Richard C., Jr. Indwelling urethral catheter and method. 4,350,161, Cl. 128-349.0BV.

Davis, Steven J.; and Rapagnani, Nazareno L., to United States of America, Air Force. Method and apparatus for analyzing supersonic flow fields by laser induced fluorescence. 4,350,661, Cl. 422-98.000.

Davitz, Daniel. Gold-colored, acid and corrosion resistant alloy. 4,350,527, Cl. 75-173.00C.

Day, Donald R.: *See—*
Kiikka, Oliver A.; and Day, Donald R., 4,351,056, Cl. 373-88.000.

De La Rue Giori S.A.: *See—*
Quinton, Brian M., 4,350,334, Cl. 271-274.000.

De La Rue Systems Limited: *See—*
Middleditch, Stanley W., 4,350,331, Cl. 271-95.000.

de la Cruz, Exequiel, to Respiratory Care, Inc. Permanent adapter for a medical humidifier. 4,350,647, Cl. 261-65.000.

Dearborn Chemical Company: *See—*
Cuisia, Dionisio G.; and Hwa, Chih M., 4,350,606, Cl. 252-392.000.

de Castiglione, Roberto; Faoro, Fiorenzo; Perseo, Giuseppe; Piani, Silvano; and Santangelo, Francesco, to Farmitalia Carlo Erba S.p.A. Biologically active peptides. 4,350,627, Cl. 260-112.50E.

Decker, Elmer L.; and Moon, James, to Quadco Alaska, Inc. Apparatus and method for field conversion of corroded pivotal couplings to non-corrodable couplings. 4,349,952, Cl. 29-402.060.

Decraemer, Alain; and Pernot, Jean-Michel, to U.S. Philips Corporation. Circuit for correcting phase deviations between the line deflection drive signals and the line synchronizing signals in a television receiver. 4,351,002, Cl. 358-158.000.

Deere & Company: *See—*
Coleman, David L., 4,350,237, Cl. 192-116.500.
Nelson, Roger J., 4,350,050, Cl. 73-861.540.

Degner, Dieter; Pander, Hans J.; and Siegel, Hardo, to BASF Aktiengesellschaft. 4-Tert.-butoxyphenylglycinonitrile and the preparation of D-(−)- and L-(+)-4-hydroxyphenylglycine. 4,350,641, Cl. 260-465.00E.

Dehlinger, John: *See—*
Cyr, Stephen J.; Schubert, John C.; and Dehlinger, John, 4,350,730, Cl. 428-215.000.

Delta, Inc.: *See—*
Groth, Hugh F.; and Duncan, L. Scot, 4,350,257, Cl. 220-4.00F.

De Luca, Ugo; and Zoppi, Francesco, to ELVI S.p.A. Aminopyrine improved Trinder's reagent and dosing process for hydrogen peroxide from enzymatic oxidation of metabolic substrata with the same. 4,350,762, Cl. 435-10.000.

DeMarco, Joseph H. Folding umbrella. 4,350,175, Cl. 135-33.00C.

Demler, Walter R.; and Odin, Eugene, to Buffalo Color Corporation. Method for recovering pure metahydroxybenzoic acid. 4,350,827, Cl. 562-475.000.

Dent, Thomas. Wood splitting device. 4,350,192, Cl. 144-193.00C.

DePuy, Robert P., to General Electric Company. Level shifting and filtering circuit. 4,350,956, Cl. 328-167.000.

Descomps, Bernard: *See—*
Nicolas, Jean-Claude; Terouanne, Beatrice; Descomps, Bernard; and Crastes de Paulet, Andre, 4,350,760, Cl. 435-7.000.

Deuker, Ernst: *See—*
Fuchs, Hugo; Brand, Uwe; Deuker, Ernst; and Frommer, Elmar, 4,350,630, Cl. 260-239.30A.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Reentrant reverberation generator for an electronic musical instrument. 4,350,072, Cl. 84-1.240.

Dev Tec Resources, Inc.: *See—*
Johnson, Ronald M., 4,350,430, Cl. 354-330.000.

DeVigili, Walter J.; and Hough, Louis E., to Emprie Automotive, Inc. Ski braking device. 4,350,365, Cl. 280-605.000.

Dewey, Clarence F., Jr.; and Wiklund, David E., to Fisher Controls Company, Inc. Vortex-shedding flowmeter having two bluff bodies. 4,350,047, Cl. 73-861.220.

Dewey, George G., to Illinois Tool Works Inc. Twist-lock connection and tool utilizing same. 4,349,929, Cl. 7-158.000.

Diachuk, Wolodymyr, to Century 21 Pollution Control, Inc. Air cleaning system. 4,350,504, Cl. 55-217.000.

Dials, Edward N.; and Kightlinger, Drew A., to International Business Machines Corporation. Ribbon loading system for a typewriter or the like using a sidemounted ribbon cartridge having a detachable ribbon guide. 4,350,452, Cl. 400-208.000.

Diamond Shamrock Corporation: *See*—
Gestaut, Lawrence J., 4,350,608, Cl. 252-425.300.

Dianov, Ivan M.: *See*—
Alexandrov, Vyacheslav S.; Guschin, Alexandr E.; Zavodov, Rudolf V.; Zhukova, Elena I.; Ivanov, Alexandr A.; Fofanova, Tatyana S.; Mikhailov, Evgeny I.; Dianov, Ivan M.; Luzin, Pavel M.; Sergeev, Igor A.; Pankratova, Lidia A.; Krylova, Vera E.; and Leibenzon, Semen A., 4,350,482, Cl. 425-83.100.

Dickinson, Kay H.; Smale, Terence C.; and Southgate, Robert, to Beecham Group Limited. β-Lactam antibacterial agents. 4,350,703, Cl. 424-274.000.

Dickinson, Roger P.: *See*—
Cross, Peter E.; and Dickinson, Roger P., 4,350,696, Cl. 424-251.000.

Die-Craft Metal Products, Inc.: *See*—
Hofbauer, John, 4,350,556, Cl. 156-541.000.

Diesel Kiki Company, Ltd.: *See*—
Sutoh, Shinji; Harada, Takeshi; and Kaneko, Shinichi, 4,350,286, Cl. 236-44.00A.

Diesel Kiki Kabushiki Kaisha: *See*—
Kubota, Yutaka; and Sugimoto, Hitoshi, 4,350,876, Cl. 219-497.000.

Diesner, Ferdinand: *See*—
Muller, Jakob; and Diesner, Ferdinand, 4,350,184, Cl. 139-448.000.

Dietz, Peter W.: *See*—
Jones, Thomas B.; Morgan, Morris H.; and Dietz, Peter W., 4,349,967, Cl. 34-1.000.

Dimalt Aktiengesellschaft: *See*—
Belohlawek, Lothar; and Weber, Wolfgang, 4,350,716, Cl. 426-626.000.

Dineen, Colin; and Wallace, Christopher A., to Elliott Brothers (London) Limited. X-Ray diffraction apparatus. 4,351,063, Cl. 378-79.000.

Dineen, John J.: *See*—
Folsom, Lawrence R.; and Dineen, John J., 4,350,012, Cl. 60-520.000.

Dingler, Geoffrey L.; Jarvis, Wilbur W.; and Spiegel, Raymond W., to Whirlpool Corporation. Chopper for dishwasher soil separator. 4,350,306, Cl. 241-46.150.

Distler, Harry; Widder, Rudi; and Uhl, Guenter, to BASF Aktiengesellschaft. Printing pastes with foam inhibitors. 4,350,531, Cl. 106-19.000.

Dlask, Jiri: *See*—
Farr, Garth M.; McCoy, Terence D.; and Dlask, Jiri, 4,350,062, Cl. 81-57.180.

Dobson, George D., to Pandrol Limited. Railway rail-fastening clip and a railway rail-and-fastening assembly. 4,350,291, Cl. 238-349.000.

Dr. H. Schmittmann GmbH: *See*—
Schmittmann, Hans B., 4,350,688, Cl. 424-182.000.

Doherty, John, Jr., to Texas Instruments Incorporated. Two-temperature thermally responsive fast idle control switch. 4,350,967, Cl. 337-343.000.

Dolland, Carlisle R.: *See*—
United States of America, National Aeronautics and Space Administration; Dolland, Carlisle R.; and Trimble, Daniel W., 4,351,022, Cl. 363-87.000.

Dominguez, Richard J. G.; Rice, Doris M.; and Zimmerman, Robert L., to Texaco Inc. Method for making RIM polyurethane elastomers using as the catalyst system a hydroxyalkylamine, dibutyltin dilaurate and an alkyltin mercaptide. 4,350,778, Cl. 521-118.000.

Dominguez, Richard J. G.; and McCoy, David R., to Texaco Inc. Method for making RIM polyurethane elastomers using as the catalyst system methyldiethanolamine, dibutyltin dilaurate and an alkyltin mercaptide. 4,350,779, Cl. 521-126.000.

Donaldson Company, Inc.: *See*—
Alseth, Steven M.; and Sullivan, Bruce M., 4,350,509, Cl. 55-337.000.
Dudrey, Denis J.; and Herman, John T., 4,350,282, Cl. 233-7.000.

Donaldson, Morris L.: *See*—
Firchau, John C.; and Donaldson, Morris L., 4,350,177, Cl. 137-370.000.

Donington, Jerrold H. Garden sieve. 4,350,584, Cl. 209-352.000.

Dooley, Carol A.: *See*—
Geelhood, Bruce D.; Mastny, Gary F.; Solomon, Jerry E.; Wesley, Edward J.; Lindner, Elek; Dooley, Carol A.; and Lane, Sandra M., 4,350,890, Cl. 250-372.000.

Dorma-Baubeschlag GmbH & Co. KG: *See*—
Tillmann, Horst, 4,349,939, Cl. 16-53.000.

Dornbusch, Arthur H.; and Smith, Raymond D., to Procter & Gamble Company, The. One-piece shipping container with cut-case protection. 4,350,281, Cl. 229-38.000.

Doshi, Mahendra F.: *See*—
Gruber, Martin V.; and Doshi, Mahendra F., 4,350,302, Cl. 239-500.000.

Dotti, Giulio; and Masoero, Renzo, to Centro Ricerche Fiat S.p.A. Self-levelling suspension system for motor-vehicles. 4,350,354, Cl. 280-6.00H.

Douty, George H.; Landis, John M.; and Ritchie, Leon T., to AMP Incorporated. Board mount zero insertion force connector. 4,350,402, Cl. 339-74.00R.

Dow Chemical Company, The: *See*—
Boussert, Anne S., 4,350,616, Cl. 252-463.000.
Burnett, Edward L.; and Stack, Eugene V., 4,350,653, Cl. 264-127.000.
Childress, David L.; Hayes, William V.; and Poppe, Richard L., 4,350,830, Cl. 562-535.000.
Mosier, Benjamin; McCrary, Jack L.; and Guilbeau, Karl G., 4,350,601, Cl. 252-8.55R.

Dowgul, Ronald W.; and Noble, Glendle W., to United States of America, Navy. Carbon dioxide absorbent canister with breathing gas temperature and flow control. 4,350,662, Cl. 422-122.000.

Dowler, Danny E.; and Oldaker, Herman F., to Dowler, Danny E.; and Oldaker, Herman F. Interlocking panel and panel track system. 4,349,995, Cl. 52-241.000.

Dragerwerk AG: *See*—
Pasternack, Adalbert, 4,350,115, Cl. 116-70.000.

Drahtmuller, Hans-Dieter, to Linde Aktiengesellschaft. Fluid motor. 4,350,079, Cl. 91-499.000.

Drake, Cyril F., to International Standard Electric Corporation. Controlled release glass. 4,350,675, Cl. 424-1.000.

Dresser Industries, Inc.: *See*—
Carrens, Donald E., 4,350,082, Cl. 92-159.000.
Eberwein, Valery D., 4,350,979, Cl. 340-861.000.

Dria, Dennis E.: *See*—
Milberger, Ernest C.; Bremer, Noel J.; and Dria, Dennis E., 4,350,639, Cl. 549-259.000.

Drozdova, Larisa A.: *See*—
Khutoretsky, Garry M.; Tjurin, Jury G.; Drozdova, Larisa A.; and Belova, Tamara N., 4,350,910, Cl. 310-64.000.

Duchesne, Ghislain, to Lar Machinerie Inc. Apparatus and method for debranching felled trees. 4,350,189, Cl. 144-2.00Z.

Dudley, Kenneth W.; Teich, Wesley W.; and Bowen, Robert F., to Raytheon Company. Microwave oven feed system. 4,350,859, Cl. 219-10.55F.

Dudrey, Denis J.; and Herman, John T., to Donaldson Company, Inc. Self-purging centrifuge. 4,350,282, Cl. 233-7.000.

Dueker, David K.: *See*—
Ford, Norman C., Jr.; and Dueker, David K., 4,350,163, Cl. 128-633.000.

Duffy, John J.: *See*—
Gitlin, Harvey S.; and Duffy, John J., 4,350,240, Cl. 194-92.000.

Duke University: *See*—
Porter, Ned A.; Ziegler, Carl B., Jr.; and Roberts, David H., 4,350,834, Cl. 568-568.000.

Duncan, L. Scot: *See*—
Groth, Hugh F.; and Duncan, L. Scot, 4,350,257, Cl. 220-4.00F.

Dunlop Limited: *See*—
Bond, Robert; and Blythe, Robert J., 4,350,621, Cl. 525-237.000.
Brownett, Robert L., 4,350,235, Cl. 192-45.000.

Duphar International Research B.V.: *See*—
Brouwer, Marius S.; and Grosscurt, Arnoldus C., 4,350,706, Cl. 424-322.000.

Du Pont de Nemours, E. I., and Company: *See*—
Johnson, Robert C., 4,350,446, Cl. 374-13.000.

Dupont, Jean, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). System for servocontrolling a separately excited DC motor. 4,350,940, Cl. 318-603.000.

Duracell Inc.: *See*—
Parsen, Frank E.; and Yatabe, Thomas T., 4,350,745, Cl. 429-57.000.

Durbin, John A.: *See*—
Avery, Stephen T.; Durbin, John A.; Lama, William L.; and Steibitz, Paul H., 4,351,019, Cl. 362-298.000.

Duro-Test Corporation: *See*—
Trutner, Donald G.; and Thorington, Luke, 4,350,722, Cl. 428-35.000.

Durr, Dieter, to Ciba-Geigy Corporation. Herbicidally active 2-nitro-5-phenoxyphenyloxazoles and -oxazolines. 4,350,519, Cl. 71-88.000.

Durr, Heinrich; Richter, Hermann; Weber, Wendelin; Goerke, Burkhard; and Engler, Peter, to U.S. Philips Corporation. Stylus printing head comprising electromagnets on resilient supports. 4,350,450, Cl. 400-124.000.

Dutcher, Robert G.; and Upton, James E., to Medtronic, Inc. Flexible tip stiffening stylet for use with body implantable lead. 4,350,169, Cl. 128-783.000.

Duvall, Leroy F., to Quaker Oats Company, The. Corn bran expanded cereal. 4,350,714, Cl. 426-559.000.

Duve, Gunther: *See*—
Kuchler, Manfred; Duve, Gunther; and Ebigt, Joachim, 4,350,782, Cl. 523-334.000.

Dykes, Coy M. Adapter for burglar alarm switch. 4,350,977, Cl. 340-545.000.

Dyson, David V.; Lees, David H.; Fenn, Michael A. F.; and Darley, Kenneth S., to Griffith Laboratories, Limited, The. Production of sponge cake. 4,350,713, Cl. 426-243.000.

E. R. Squibb & Sons, Inc.: *See*—
Hauck, Frederic P.; and Fox, Rita T., 4,350,812, Cl. 544-79.000.

Eapen, Kuttikandathil E.: *See*—
Kahn, Marvin L.; and Eapen, Kuttikandathil E., 4,350,711, Cl. 426-102.000.

Eastman Kodak Company: *See*—
Contois, Lawrence E., 4,350,751, Cl. 430-135.000.
Fiske, John M.; and Velzen, Richard, 4,350,435, Cl. 355-14.00C.
Holzhauser, Ronald C.; McGlen, James A.; and Russel, Matthew J., 4,350,329, Cl. 271-9.000.
Jackson, Winston J., Jr.; and Darnell, William R., 4,350,805, Cl. 528-271.000.
McConnell, Richard L.; Trotter, Jimmy R.; and Jones, Glenn C., 4,350,807, Cl. 528-302.000.

McConnell, Richard L.; Trotter, Jimmy R.; and Jones, Glenn C., 4,350,808, Cl. 528-302.000.
Reczek, James A.; and Welter, Thomas R., 4,350,752, Cl. 430-219.000.

Eaton, Sargent S., Jr.; and Wooten, David R., to Inmos Corporation. Folded bit line-shared sense amplifiers. 4,351,034, Cl. 365-189.000.

Eberwein, Valery D., to Dresser Industries, Inc. System and method for well-logging. 4,350,979, Cl. 340-861.000.

Ebigt, Joachim: *See—*
Kuchler, Manfred; Duve, Gunther; and Ebigt, Joachim, 4,350,782, Cl. 523-334.000.

Eckenhoff, James B., to Alza Corporation. Water absorbing fluid dispenser. 4,350,271, Cl. 222-386.500.

Ecole, Auguste, to Equipements Automobiles Marchal. Travel limit stop device for a motor-reducing unit intended in particular for a window wiper. 4,350,938, Cl. 318-443.000.

Eddens, Gerald R., to W. J. Industries, Incorporated. Magnetic particle devices. 4,350,913, Cl. 310-103.000.

Eddy, William C.: *See—*
Casey, Gary L.; Harvey, Bruce J.; Hebert, Kenneth A.; and Eddy, William C., 4,350,135, Cl. 123-564.000.

Edwards, Philip N.; and McMenim, Michael E., to Imperial Chemical Industries Limited. Process for preparing p-hydroxy phenylglycine. 4,350,826, Cl. 562-444.000.

Eisai Co., Ltd.: *See—*
Hamano, Sachiyuki; Kitamura, Shinichi; Igarashi, Toshiji; and Nakajima, Yoshikage, 4,350,705, Cl. 424-278.000.
Mizuno, Yasuhiko; and Kayano, Masanori, 4,350,679, Cl. 424-38.000.

Elders, Gerald W. Roof support pin. 4,350,462, Cl. 405-259.000.

Electric Power Research Institute, Inc.: *See—*
Harrold, Ronald T., 4,350,838, Cl. 174-15.00R.

Electro Materials Corp. of America: *See—*
Hilson, David G.; Johnson, Gary W.; and Schoonejongen, Ronald J., 4,350,618, Cl. 252-514.000.

Eller, J. David. Hydraulic motor system for driving a submersible impeller pump in which hydraulic surge at start-up and shut-down is cushioned. 4,350,476, Cl. 417-304.000.

Elliott Brothers (London) Limited: *See—*
Dineen, Colin; and Wallace, Christopher A., 4,351,063, Cl. 378-79.000.

Elliott, Charles A., to RCA Corporation. Video disc player having carriage detent mechanism. 4,351,046, Cl. 369-233.000.

Elliott, Gary S.: *See—*
Yargus, Lloyd A.; Switzer, Lester W., Sr.; Allen, Gary N.; Elliott, Gary S.; Yargus, Larry D.; Lowry, William D.; Gosnell, Jeffrey M.; and Spires, Darrell J., 4,350,444, Cl. 366-141.000.

Elms, Robert T.; Engel, Joseph C.; Mercier, Bernard J.; Saletta, Gary F.; and Wilson, John T., to Westinghouse Electric Corp. Circuit interrupter with digital trip unit and means to enter trip settings. 4,351,012, Cl. 361-96.000.

Elstner, Hans. Medical kit for the protective storage of teat swabs. 4,350,245, Cl. 206-207.000.

ELVI S.p.A.: *See—*
De Luca, Ugo; and Zoppi, Francesco, 4,350,762, Cl. 435-10.000.

Emerson Electric Co.: *See—*
Burton, Stephen J., 4,350,912, Cl. 310-90.000.

EMI Limited: *See—*
Robinson, Grenville A.; Kember, Peter N.; and Burns, Derek K., 4,350,660, Cl. 422-90.000.

Emmerich, Heinz: *See—*
Kossek, Gunter; and Emmerich, Heinz, 4,350,123, Cl. 123-2.000.

Emprie Automotive, Inc.: *See—*
DeVigili, Walter J.; and Hough, Louis E., 4,350,365, Cl. 280-605.000.

Energy Optics, Inc.: *See—*
Ward, Steven M., 4,350,980, Cl. 340-870.020.

Engel, Joseph C.: *See—*
Elms, Robert T.; Engel, Joseph C.; Mercier, Bernard J.; Saletta, Gary F.; and Wilson, John T., 4,351,012, Cl. 361-96.000.
Matsko, Joseph J.; Wafer, John A.; Engel, Joseph C.; and Mercier, Bernard J., 4,351,013, Cl. 361-96.000.

Engelbrecht & Lemmerbrock GmbH & Co.: *See—*
Julke, Bernhard, 4,350,468, Cl. 414-325.000.

Engelsmann, Dieter; Maas, Dieter; Zattler, Kurt; and Schultes, Herbert, to AGFA-Gevaert Aktiengesellschaft. Camera with flash unit. 4,350,420, Cl. 354-145.000.

Engelsmann, Dieter; Nicko, Reinhard; Bittner, Wilfried; and Karl, Horst, to Agfa-Gevaert Aktiengesellschaft. Still camera with a retractable objective. 4,350,423, Cl. 354-173.000.

Engle, Edgar W., to TRW Inc. Method for diffusion bonding workpieces and article fabricated by same. 4,350,528, Cl. 75-203.000.

Engler, Peter: *See—*
Durr, Heinrich; Richter, Hermann; Weber, Wendelin; Goerke, Burkhard; and Engler, Peter, 4,350,450, Cl. 400-124.000.

Equipements Automobiles Marchal: *See—*
Ecole, Auguste, 4,350,938, Cl. 318-443.000.

Equipment Systems & Devices, Inc.: *See—*
Gitlin, Harvey S.; and Duffy, John J., 4,350,240, Cl. 194-92.000.

Erickson, Donald C. Absorption heat pump augmented thermal separation process. 4,350,571, Cl. 203-21.000.

Erwin, Louis R.; and Hurlong, Granville W., Jr., to Bendix Corporation, The. Flow controlled pressure regulating device. 4,350,301, Cl. 239-453.000.

Escande, Henri. Process and apparatus for drying material. 4,349,968, Cl. 34-13.000.

Espagnacq, Andre: *See—*
Cannavo, Christian G.; Cousin, Georges; Espagnacq, Andre; Frayssac, Jacques X.; Laine, Loic Y.; Midrouillet, Daniel J.; Pintenat, Andre M.; and Reboux, Jean B., 4,350,096, Cl. 102-209.000.

Esselink, Abraham J., to Ingeniersbureau "Essex" B.V. Process and apparatus for separating gaseous component from a mixture. 4,350,500, Cl. 55-26.000.

Essex Group, Inc.: *See—*
Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., 4,350,737, Cl. 428-383.000.
Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., 4,350,738, Cl. 428-383.000.

Estel Hoogovens B.V.: *See—*
Kramer, Petrus J. A., 4,350,324, Cl. 266-44.000.

Etat Francais as represented by the Delegue General pour l'Armement: *See—*
Charles, Joel M.; and Toscano, Robert J., 4,350,323, Cl. 254-273.000.

Etat Francais represente par le Delegation General pour l'Armement: *See—*
Cannavo, Christian G.; Cousin, Georges; Espagnacq, Andre; Frayssac, Jacques X.; Laine, Loic Y.; Midrouillet, Daniel J.; Pintenat, Andre M.; and Reboux, Jean B., 4,350,096, Cl. 102-209.000.

Ets Francois Salomon & Fils: *See—*
Salomon, Georges P. J., 4,350,364, Cl. 280-605.000.

Euro-Linea S.n.c. di Colombo & C.: *See—*
Cereghini, Giuseppe, 4,350,650, Cl. 264-39.000.

Everest, David C., III, to Lange International S.A. Forward lean adjuster for ski boots. 4,349,971, Cl. 36-121.000.

Ewanus, Walter, to Westinghouse Electric Corp. Communication. 4,351,064, Cl. 455-29.000.

Exxon Research & Engineering Co.: *See—*
Huang, I-Der, 4,350,825, Cl. 562-406.000.

Fahley, Jerome A.: *See—*
van Dyke, Martin J.; and Fahley, Jerome A., 4,350,039, Cl. 73-304.00C.

Fahmy, Mohamed A. H.; Fukuto, Tetsuo R.; and Jojima, Teruomi, to University of California, The Regents of the. Pyridylalkoxysulfinyl derivatives of carbamate esters. 4,350,699, Cl. 424-263.000.

Faoro, Fiorenzo: *See—*
de Castiglione, Roberto; Faoro, Fiorenzo; Perseo, Giuseppe; Piani, Silvano; and Santangelo, Francesco, 4,350,627, Cl. 260-112.50E.

Farmitalia Carlo Erba S.p.A.: *See—*
de Castiglione, Roberto; Faoro, Fiorenzo; Perseo, Giuseppe; Piani, Silvano; and Santangelo, Francesco, 4,350,627, Cl. 260-112.50E.

Farnam Companies, Inc.: *See—*
Shotwell, Thomas K., 4,350,122, Cl. 119-106.000.

Farr, Garth M.; McCoy, Terence D.; and Dlask, Jiri, to Farr Oil Tool, Inc. Power tong. 4,350,062, Cl. 81-57.180.

Farr Oil Tool, Inc.: *See—*
Farr, Garth M.; McCoy, Terence D.; and Dlask, Jiri, 4,350,062, Cl. 81-57.180.

Fasching, George E.; and Utt, Carroll E., to United States of America, Energy. Capacitance-level/density monitor for fluidized-bed combustor. 4,350,040, Cl. 73-304.00C.

Faulkner, Duane H.; and Chenoweth, Vaughn C., to Guardian Industries Corporation. Outlet for a glass melting furnace. 4,350,516, Cl. 65-327.000.

Fechner, Wolf D.; Kranz, Joachim; and Polster, Rudolf, to BASF Aktiengesellschaft. Fluid, stable formulations of copper phthalocyanine or indanthrone. 4,350,534, Cl. 106-288.00Q.

Federal Pacific Electric Company: *See—*
Norden, Alexander R., 4,350,965, Cl. 337-47.000.

Fedotov, Vladimir M.: *See—*
Kolesov, Evgeny V.; Smirnov, Boris A.; Fedotov, Vladimir M.; and Lipovsky, Iosif L., 4,350,160, Cl. 128-334.00R.

Feher, Kamilo, to Canadian Patents & Dev. Limited. Time jitter determining apparatus. 4,350,879, Cl. 235-92.0EC.

Felbinger, Willy, to Saint Gobain Vitrage. Device for arresting the motion of a motor driven panel. 4,351,016, Cl. 361-181.000.

Feldbau, Elliot V. Teeth protecting device. 4,350,154, Cl. 128-136.000.

Fenn, Michael A. F.: *See—*
Dyson, David V.; Lees, David H.; Fenn, Michael A. F.; and Darley, Kenneth S., 4,350,713, Cl. 426-243.000.

Ferris, Tom E. Auxiliary load-carrying apparatus. 4,350,358, Cl. 280-81.00R.

Ferrofluidics Corporation: *See—*
Helgeland, Walter; Teverovsky, Alex; Kerwin, Kenneth H., II; and Chartier, Carl P., 4,350,560, Cl. 156-617.0SP.
Scholl, Richard A.; and Cole, John L., 4,350,557, Cl. 156-601.000.

Fettes, Ivy: *See—*
Baxter, John D.; Feties, Ivy; and Shine, John, 4,350,764, Cl. 435-69.000.

Fickes, Edward L., to AMP Incorporated. Wire insertion tool. 4,349,944, Cl. 29-566.400.

Field, Thomas R.; Jagodzinski, Peter F.; King, James F.; and Schaefer, John O., to International Business Machines Corporation. Cartridge for correction media or tacky tape with a wrap spring. 4,350,453, Cl. 400-208.000.

Fielden, John S.: *See—*
Peddie, Robert A.; and Fielden, John S., 4,351,028, Cl. 364-483.000.

Fillus, Gary C.; and Long, Eric L., to Allen-Bradley Company. Illuminated industrial membrane switch. 4,350,857, Cl. 200-314.000.

Finck, Johan C. J.: *See*—
van Alem, Antonius A. M.; Finck, Johan C. J.; and van de Water, Peter W. M., 4,351,051, Cl. 372-36.000.

Findlay, Ronald G.: *See*—
Countryman, Gerald P.; and Findlay, Ronald G., 4,350,449, Cl. 400-120.000.

Firchau, John C.; and Donaldson, Morris L. Utility box support. 4,350,177, Cl. 137-370.000.

Firestone Tire & Rubber Company, The: *See*—
Bohm, Georg G. A.; Hamed, Gary R.; and Vescelius, Lee E., 4,350,795, Cl. 525-194.000.

Fischer, Hannes; and Plum, Helmut, to Hoechst Aktiengesellschaft. Process for the preparation of copolymers containing hydroxyl groups. 4,350,809, Cl. 528-361.000.

Fischer, Hermann, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Ink transfer apparatus for rotary offset printing machines. 4,350,094, Cl. 101-350.000.

Fishburn, Charles E., to National Printing Plate Company, Inc. Apparatus and method for producing images of various sizes on photosensitive film. 4,350,437, Cl. 355-52.000.

Fisher Controls Company, Inc.: *See*—
Dewey, Clarence F., Jr.; and Wiklund, David E., 4,350,047, Cl. 73-861.220.

Fisher, Robert H., to United States of America, National Security Agency. Method of position fixing active sources utilizing differential doppler. 4,350,984, Cl. 343-112.00R.

Fiske, John M.; and Velzen, Richard, to Eastman Kodak Company. Copy contrast and density control. 4,350,435, Cl. 355-14.00C.

Fitzgerald, Maurice J.; and Platt, Thomas E., to Polaroid Corporation. Allyl amine polymeric binders for photographic emulsions. 4,350,759, Cl. 430-630.000.

Flaherty, John J.; Strauts, Eric J.; Wagerer, Helmut F.; and Loose, Timothy C., to Magnaflux Corporation. Nondestructive testing system having automatic set-up means. 4,351,031, Cl. 364-580.000.

Fleischer, Henry. Coupling device. 4,350,373, Cl. 285-55.000.

Fleischmann, Gary A.; and Klessig, Clarence E., to Kohler Co. Faucet handle assembly. 4,349,940, Cl. 16-110.00R.

Flensberg, Hermann: *See*—
Scheidegger, Hans; Flensberg, Hermann; and Bauhofer, Roland, 4,350,494, Cl. 8-636.000.

Florian, Rudolf; and Herrmann, Albert. Induction crucible furnace and method for its preparation. 4,351,058, Cl. 373-155.000.

FMC Corporation: *See*—
Lochte, Glen E.; and Allen, Jackie R., 4,350,371, Cl. 285-18.000.
Skoli, Sigmund P.; Kemp, David M.; and Mojonnier, Harry G., 4,350,503, Cl. 55-165.000.

Focke & Co.: *See*—
Focke, Heinz H., 4,350,002, Cl. 53-449.000.

Focke, Heinz H., to Focke & Co. Process and apparatus for packing individual articles, in particular bottles, one into each package. 4,350,002, Cl. 53-449.000.

Fofanova, Tatyana S.: *See*—
Alexandrov, Vyacheslav S.; Guschin, Alexandr E.; Zavodov, Rudolf V.; Zhukova, Elena I.; Ivanov, Alexandr A.; Fofanova, Tatyana S.; Mikhailov, Evgeny I.; Dianov, Ivan M.; Luzin, Pavel M.; Sergeev, Igor A.; Pankratova, Lidia A.; Krylova, Vera E.; and Leibenzon, Semen A., 4,350,482, Cl. 425-83.100.

Folger, Philip M., to General Electric Company. Fluid pressure actuating device. 4,350,053, Cl. 74-2.000.

Folsom, Lawrence R.; and Dineen, John J., to Mechanical Technology Incorporated. Diaphragm coupling between the displacer and power piston. 4,350,012, Cl. 60-520.000.

Fontana, Frank J., to Stewart-Warner Corporation. Caster assembly with swivel lock and brake. 4,349,937, Cl. 16-35.00R.

Fontana, Frank J., to Stewart-Warner Corporation. Caster assembly with swivel lock. 4,349,938, Cl. 16-35.00R.

Forbes, Martin J.: *See*—
Yannas, Ioannis V.; and Forbes, Martin J., 4,350,629, Cl. 260-123.700.

Forch, Karl, to Thyssen Aktiengesellschaft. Magnetic suspension railroad parts. 4,350,525, Cl. 75-124.000.

Ford Aerospace & Communications Corp.: *See*—
Stahlhuth, Paul H., 4,350,236, Cl. 192-84.00C.

Ford, Horace B. Phase converter controlled by D-C power. 4,350,945, Cl. 318-795.000.

Ford Motor Company: *See*—
Bachrach, Benjamin I., 4,350,865, Cl. 219-69.00M.
Chattha, Mohinder S., 4,350,790, Cl. 525-110.000.
McClure, George W.; and Milenkovic, Veljko, 4,350,941, Cl. 318-603.000.
Shulman, Michael A., 4,350,130, Cl. 123-440.000.

Ford, Norman C., Jr.; and Dueker, David K. Method and apparatus for analyzing contaminants in aqueous humor. 4,350,163, Cl. 128-633.000.

Forrester, John S.; Swindell, David F.; and Wildsmith, Michael A., to Lucas Industries Limited. Circuit for use in the detection of the condition of an isolated switch contact. 4,350,971, Cl. 340-52.00R.

Forschungsinstitut Berghof GmbH: *See*—
Schmoldt, Harm; Kock, Klaus; and Strathmann, Heinrich, 4,350,581, Cl. 204-301.000.

Foss Manufacturing Company, Inc.: *See*—
Goodwin, Robert F., 4,350,732, Cl. 428-246.000.

Foster Wheeler Energy Corporation: *See*—
Stewart, Robert D.; and Gamble, Robert L., 4,349,969, Cl. 34-57.00A.

Fouser, W. Thomas: *See*—
Schmelzer, Lynn A.; and Fouser, W. Thomas, 4,350,460, Cl. 404-117.000.

Fowler, John H., to Smith International, Inc. Heat resistant seal. 4,350,346, Cl. 277-26.000.

Fowler, Lawrence A.: *See*—
Astfalk, Gregory; Fowler, Lawrence A.; Herring, Chauncey, Jr.; and Szymczak, Thaddeus J., 4,351,030, Cl. 364-552.000.

Fox, Anthony. Multi-purpose power tool. 4,349,945, Cl. 29-27.00A.

Fox, Billy E.: *See*—
Beyer, Charles L.; and Fox, Billy E., 4,350,142, Cl. 126-288.000.

Fox, Rita T.: *See*—
Hauck, Frederic P.; and Fox, Rita T., 4,350,812, Cl. 544-79.000.

Foxboro Company, The: *See*—
Richer, Donald K., 4,351,023, Cl. 364-187.000.

Frank, Anton: *See*—
Rogner, Thomas; and Frank, Anton, 4,350,011, Cl. 60-337.000.

Frank, Joseph A.: *See*—
Liska, Donald J.; Schamaun, Roger G.; Clark, Donald C.; Potter, R. Christopher; and Frank, Joseph A., 4,350,921, Cl. 313-360.100.

Frank, Karl; and Marnette, Ewald, to Kohlensaure-Werke Rud. Buse GmbH & Co. Gas recovery system. 4,350,018, Cl. 62-54.000.

Franke, Walter: *See*—
Paulus, Rudolf; Schankat, Norbert; Weinzierl, Manfred; and Franke, Walter, 4,350,434, Cl. 355-14.0SH.

Franklin, Benjamin S.: *See*—
Bradley, John J.; and Franklin, Benjamin S., 4,351,024, Cl. 364-200.000.

Frantom, Richard L.; Stephenson, Robert L.; and Thomas, Rudy V., to Allied Corporation. Passive seat belt system for three occupant seat. 4,350,368, Cl. 280-804.000.

Fratty, Hector, to Cibie Projecteurs. Lamp with stepped reflector surface containing vertical ribs. 4,351,018, Cl. 362-215.000.

Frayssac, Jacques X.: *See*—
Cannavo, Christian G.; Cousin, Georges; Espagnacq, Andre; Frayssac, Jacques X.; Laine, Loic Y.; Midrouillet, Daniel J.; Pintenat, Andre M.; and Reboux, Jean B., 4,350,096, Cl. 102-209.000.

Freeman, Robert S., to Strong Electric Corporation. Apparatus to control light intensity from arc lamp. 4,350,417, Cl. 353-90.000.

Frehner, Roland. Method and apparatus for the production of hollow bodies by winding. 4,350,549, Cl. 156-161.000.

Fresnel, Jean-Marie: *See*—
Porta, Augusto; Fresnel, Jean-Marie; and Kulhanek, Antonin, 4,350,575, Cl. 204-84.000.

Friedline, Ernest J., to Kennametal Inc. Arrangement for mounting a cutter. 4,350,463, Cl. 409-234.000.

Frieser, Rudolf G.; Ma, William H.; Ozols, Gunars M.; and Zingerman, Bryant N., to International Business Machines Corporation. Cathode for etching. 4,350,578, Cl. 204-192.00R.

Frito-Lay, Inc.: *See*—
Merck, Howard W., 4,350,251, Cl. 209-642.000.

Fritz Eichenauer, Firma: *See*—
Meywald, Klaus; and Ohnmacht, Helmut, 4,350,872, Cl. 219-376.000.

Frohling, Peter; Schulz, Franz F.; and Wiedemer, Karl. Apparatus for braking travelling strip material. 4,350,310, Cl. 242-75.200.

Frommer, Elmar: *See*—
Fuchs, Hugo; Brand, Uwe; Deuker, Ernst; and Frommer, Elmar, 4,350,630, Cl. 260-239.30A.

Frutiger, Peter: *See*—
Sturzinger, Oskar E.; and Frutiger, Peter, 4,350,844, Cl. 178-22.180.

Fry, Jeremy J.; and Warnett, Christopher, to Rotork Controls Limited. Fail-safe device for actuators. 4,350,081, Cl. 92-128.000.

Fuchs, Hugo; Brand, Uwe; Deuker, Ernst; and Frommer, Elmar, to BASF Aktiengesellschaft. Continuous extraction of caprolactam from an aqueous solution containing caprolactam and its oligomers. 4,350,630, Cl. 260-239.30A.

Fuchs, Rainer; Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, to Bayer Aktiengesellschaft. Preparation of substituted (cyclo)alkanecarboxylic acid α-cyano-3-phenoxy-benzyl esters. 4,350,640, Cl. 260-465.00D.

Fuchs, Werner: *See*—
Rieber, Norbert; Bohm, Heinrich; Platz, Rolf; and Fuchs, Werner, 4,350,819, Cl. 548-375.000.

Fuchsluger, George L.: *See*—
Watkins, William L., III; Chavis, Thurston L., Jr.; and Fuchsluger, George L., 4,350,648, Cl. 261-120.000.

Fuderer, Andrija, to Union Carbide Corporation. Isobaric process for separating normal paraffins from hydrocarbon mixtures. 4,350,583, Cl. 208-310.00Z.

Fuji Electric Co. Ltd.: *See*—
Uenosono, Chikasa; Okada, Takao; Matsuki, Junya; Naito, Tadashi; Inoue, Shinichiro; and Takahashi, Masaki, 4,350,947, Cl. 322-17.000.

Fuji Photo Film Co., Ltd.: *See*—
Arai, Yoshihiro, 4,351,010, Cl. 360-131.000.
Takahashi, Kenji; and Miyahara, Junji, 4,350,893, Cl. 250-484.100.

Fujii, Chiaki. Load carrying platform for a bicycle. 4,350,361, Cl. 280-289.00A.

Fujii, Hiroo; Tanaka, Kiyoaki; Nakamura, Masashi; Okuno, Ryuzo; Hashizume, Shigeyuki; Katayama, Hideo; and Fujita, Tsutomu, to Kawasaki Jukogyo Kabushiki Kaisha; and Kawasaki Steel Corporation. Apparatus for heat recovery from molten slag. 4,350,326, Cl. 266-201.000.

Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, to Taiho Pharmaceutical Company, Limited. Pharmaceutical composition containing 1,3,5-substituted biuret compound. 4,350,700, Cl. 424-263.000.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Hashimoto, Misashi; Hemmi, Keiji; Aratari, Matsuhiko; Takeno, Hidekazu; and Hagiwara, Daijiro, 4,350,694, Cl. 424-248.540.
Kamiya, Takashi; and Teraji, Tsutomu, 4,350,692, Cl. 424-246.000.
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tozuka, Zenzaburo, 4,350,693, Cl. 424-246.000.

Fujita, Shinichi, to Nippon Gakki Seizo Kabushiki Kaisha. Bidirectional switching circuit with control terminal. 4,350,949, Cl. 323-284.000.

Fujita, Tsutomu: *See—*
Fujii, Hiroo; Tanaka, Kiyoaki; Nakamura, Masashi; Okuno, Ryuzo; Hashizume, Shigeyuki; Katayama, Hideo; and Fujita, Tsutomu, 4,350,326, Cl. 266-201.000.

Fujitsu Limited: *See—*
Iwamoto, Hisao; and Wakatsuki, Noboru, 4,350,963, Cl. 333-151.000.
Nakano, Motoo; and Ogawa, Tsutomu, 4,350,536, Cl. 148-1.500.
Shiratori, Takahisa; Tamura, Masaru; and Hanada, Kouji, 4,350,856, Cl. 200-306.000.
Takada, Tadakazu; Tokitomo, Kazuo; and Hoshino, Hitoshi, 4,350,563, Cl. 156-643.000.
Zasio, John J.; and Samuels, Michael W., 4,350,866, Cl. 219-121.0EM.

Fukaya, Shigeo: *See—*
Masuko, Tatsuo; Fukaya, Shigeo; Murai, Nobuyuki; and Noma, Jun, 4,350,829, Cl. 562-531.000.

Fukuda, Masataro: *See—*
Yamashita, Toshio; Gamo, Takaharu; Moriwaki, Yoshio; and Fukuda, Masataro, 4,350,673, Cl. 423-644.000.

Fukumori, Katuaki: *See—*
Shimokawa, Wataru; Ito, Yoshiaki; Kobayashi, Koichi; Fukumori, Katuaki; and Iwase, Nobukazu, 4,350,788, Cl. 524-309.000.

Fukuroi, Takeo, to Yoshida Kogyo Kabushiki Kaisha. Method of manufacturing slide fastener coupling elements. 4,349,953, Cl. 29-410.000.

Fukushima, Tadahide: *See—*
Iwashita, Tomonori; and Fukushima, Tadahide, 4,350,424, Cl. 354-173.000.

Fukuto, Tetsuo R.: *See—*
Fahmy, Mohamed A. H.; Fukuto, Tetsuo R.; and Jojima, Teruomi, 4,350,699, Cl. 424-263.000.

Fukutome, Satoru; Hatanaka, Hideo; and Saito, Motoyuki, to Citizen Watch Co., Ltd. Acoustic alarm device for watches. 4,351,041, Cl. 368-88.000.

Fulton, James E., Jr., to A.H.C. Pharmacal, Inc. Stabilized benzoyl peroxide compositions. 4,350,681, Cl. 424-53.000.

Furr, Danny L., to Phillips Petroleum Company. Fractional distillation column control. 4,350,569, Cl. 203-2.000.

Furrow, Edward D., to General Electric Company. Slidably positionable cartridge having skewed ribbon feed. 4,350,451, Cl. 400-208.000.

Furuya, Takashi: *See—*
Imai, Ichiro; Furuya, Takashi; Ando, Narumi; and Kitajima, Satoyuki, 4,350,538, Cl. 148-12.00D.

Gagnebin, Pierre-Luc: *See—*
Ginalski, Pierre; and Gagnebin, Pierre-Luc, 4,351,042, Cl. 368-188.000.

Galazka, Szczepan: *See—*
Biolik, Felicjan; Lukasik, Adam; Morys, Zagmunt; Walawender, Stanislaw; and Galazka, Szczepan, 4,351,057, Cl. 373-117.000.

Galer, Richard E.; Blasius, John R.; and Webb, Paul C., to United States Gypsum Company. High early strength cement. 4,350,533, Cl. 106-89.000.

Galfre, Giovanni; Milstein, Cesar; and Wright, Bruce W., to National Research Development Corporation. Antibody production from hybrid cell line. 4,350,683, Cl. 424-85.000.

Gallis, Anthony J., to Harsco Corporation. Tie plate. 4,350,318, Cl. 249-40.000.

Gamble, Robert L.: *See—*
Stewart, Robert D.; and Gamble, Robert L., 4,349,969, Cl. 34-57.00A.

Gambro AB: *See—*
Hakansson, Hakan B.; Persson, Lennart P. E.; and Wall, Berth-Ove G., 4,349,958, Cl. 29-612.000.

Gambro Dialysatoren KG: *See—*
Rosemeier, Friedrich; and Kerber, Helmut, 4,350,284, Cl. 233-27.000.

Gamo, Takaharu: *See—*
Yamashita, Toshio; Gamo, Takaharu; Moriwaki, Yoshio; and Fukuda, Masataro, 4,350,673, Cl. 423-644.000.

Gannaway, Edwin L., to Tecumseh Products Company. Heat barrier for refrigeration compressor piston. 4,350,083, Cl. 92-238.000.

Ganyard, Floyd P., to United States of America, Energy. Alarm toe switch. 4,350,853, Cl. 200-52.00R.

Garabedian, Armen. Method of laminating plastic sheets. 4,350,545, Cl. 156-87.000.

Garagnani, Enea: *See—*
Marzola, Roberto; Garagnani, Enea; and Moro, Alessandro, 4,350,797, Cl. 525-293.000.

Garbalizer Corp. of America: *See—*
Brewer, John C., 4,350,308, Cl. 241-294.000.

Garner, Daniels S.: *See—*
Greenawalt, Eddie L.; Ray, Steve C.; and Garner, Daniels S., 4,350,003, Cl. 53-548.000.

Garrod, Norman J. Covers for cassette boxes. 4,350,247, Cl. 206-387.000.

Garvey Corporation: *See—*
Covert, William J., 4,349,998, Cl. 53-53.000.

Gaspard, Martin. Spray cultivator for spraying weeds under crops of varying heights growing on level and non-level fields. 4,350,294, Cl. 239-169.000.

Gasser, Hermann; Curiger, Karl; and Novak, Peter, to Luwa AG. Spinning frame. 4,350,007, Cl. 57-304.000.

Gay, Tom A.; Hartman, Gary L.; and Stein, Gunter, to Honeywell Inc. Adaptive riser angle position reference system. 4,351,027, Cl. 364-432.000.

Gaydon, Jean P.: *See—*
Pouillange, Jean P.; Gaydon, Jean P.; and Chausse, Bernard, 4,350,861, Cl. 219-10.61R.

Gaynor, Edwin S. Connector for circular fluorescent lamp. 4,350,400, Cl. 339-50.00C.

Gaysert, Gerhard, to J. Eberspacher. Catalytic converter for treatment of the exhaust gases of internal combustion engines. 4,350,664, Cl. 422-179.000.

Gdovin, David P., to Singer Company, The. Dome field of view scene extenders. 4,350,489, Cl. 434-40.000.

Geelhood, Bruce D.; Mastny, Gary F.; Solomon, Jerry E.; Wesley, Edward J.; Lindner, Elek; Dooley, Carol A.; and Lane, Sandra M., to United States of America, Navy. Apparatus for monitoring low level light emission in underwater environment. 4,350,890, Cl. 250-372.000.

Geiser, Joseph F.: *See—*
Hopper, Roger J.; Sturm, Budd H.; and Geiser, Joseph F., 4,350,818, Cl. 548-166.000.

Geiss, Karl-Heinz: *See—*
Kastner, Gerhard; Siegel, Hardo; and Geiss, Karl-Heinz, 4,350,636, Cl. 549-435.000.

Geist, Wayne R.: *See—*
Bahr, Melford J.; and Geist, Wayne R., 4,350,466, Cl. 414-128.000.

Gelfand, Mikhail L.: *See—*
Antipov, Georgy A.; Gelfand, Mikhail L.; Tsipenjuk, Yakov I.; Goldshtein, Boris G.; Lavnikov, Nikolai S.; Teres, Leonid N.; Urazhdin, Ivan I.; Yakubovsky, Petr S.; Boiko, Vitaly T.; Kalmykov, Anatoly M.; Minyashkin, Dmitry P.; and Stepanov, Mikhail M., 4,350,213, Cl. 173-93.600.

General Battery Corporation: *See—*
Urban, Todd A., 4,349,959, Cl. 29-730.000.

General Electric Company: *See—*
Aftergut, Siegfried; and Cole, Herbert S., Jr., 4,350,603, Cl. 252-299.100.
Challen, Richard F., 4,351,032, Cl. 364-724.000.
Dakin, James T., 4,350,473, Cl. 416-1.000.
DePuy, Robert P., 4,350,956, Cl. 328-167.000.
Folger, Philip M., 4,350,053, Cl. 74-2.000.
Furrow, Edward D., 4,350,451, Cl. 400-208.000.
Goldbach, William R., 4,350,406, Cl. 339-111.000.
Jones, Thomas B.; Morgan, Morris H.; and Dietz, Peter W., 4,349,967, Cl. 34-1.000.
Kalan, Gary L.; and Ipsen, Peter G., 4,350,345, Cl. 277-3.000.
Koenig, Fredrick, 4,349,956, Cl. 29-596.000.
Peil, William; and McFadyen, Robert J., 4,350,930, Cl. 315-49.000.
Peroutky, Donald C., 4,350,379, Cl. 294-65.500.
Perry, Fred G., 4,350,972, Cl. 340-825.000.
Talbot, Dean W., 4,350,783, Cl. 523-505.000.
Wei, Ching-Yeu, 4,350,564, Cl. 156-659.100.

General Motors Corporation: *See—*
Lo, Wayne, 4,350,990, Cl. 357-16.000.

Geney, Christian, to SMH-Adrex. Parallel-wheel printers. 4,350,092, Cl. 101-99.000.

George, David B.: *See—*
Knoepke, John R.; and George, David B., 4,350,524, Cl. 75-63.000.

Georgia Tech Research Institute: *See—*
Steenblik, Richard A.; and Ho, Dar-Veig, 4,350,412, Cl. 350-292.000.

Geschka, Hugo W., to LUK Lamellen und Kupplungsbau GmbH. Automatic towel dispenser. 4,350,028, Cl. 68-13.00R.

Gestaut, Lawrence J., to Diamond Shamrock Corporation. Oxygen cathode for alkali-halide electrolysis and method of making same. 4,350,608, Cl. 252-425.300.

Gewerkschaft Eisenhutte Westfalia: *See—*
Heberling, Walter; Muller, Wolfgang; Langenberg, Werner; Behrens, Gerhard; and Saul, Alfred, 4,350,393, Cl. 299-50.000.

Gheen, Lyndle G., to Pierce Corporation. Linear move developments. 4,350,295, Cl. 239-178.000.

Gielly, Jean-Francois: *See—*
Bigot, Bernard; and Gielly, Jean-Francois, 4,350,671, Cl. 423-320.000.

Gilbert, Ian D.; Halloran, Michael T.; and Roos, Ermi, to Coulter Electronics, Inc. Centrifugal feeder. 4,350,292, Cl. 239-7.000.

Gillberg, James E., to RCA Corporation. Circuit with dual-purpose terminal. 4,350,906, Cl. 307-469.000.

Ginalski, Pierre; and Gagnebin, Pierre-Luc, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Timepiece including a storage arrangement. 4,351,042, Cl. 368-188.000.

Girardin, Roger: *See—*
Janicke, Johann; and Girardin, Roger, 4,350,864, Cl. 219-69.00W.

Girling Limited: *See—*
Ingram, Brian; Harries, David A.; and Natarajan, Ramamurthy, 4,350,230, Cl. 188-79.000.

Gitlin, Harvey S.; and Duffy, John J., to Equipment Systems & Devices, Inc. Coin slide with interchangeable cores. 4,350,240, Cl. 194-92.000.

Glatzhoefer, Horst: *See—*
Vester, Ewald; Grussaber, Rolf; Kupper, Wolfgang; and Glatzhoefer, Horst, 4,349,964, Cl. 33-264.000.

Gleason, John G.; and Hill, David T., to SmithKline Corporation. Antiallergic imidosulfamides. 4,350,698, Cl. 424-258.000.

Gleason, John G.: *See—*
Ali, Faida E.; and Gleason, John G., 4,350,685, Cl. 424-45.000.

Go-Jo Industries, Inc.: *See—*
Potter, Charles, 4,350,268, Cl. 222-214.000.

Godek, James L.; and Gowman, Lawrence P., to Wayne Chemical Products Company. Metal drawing compound composition and method of use. 4,350,034, Cl. 72-42.000.

Goelz, David W.: *See—*
Hetherington, Robert D.; and Goelz, David W., 4,350,266, Cl. 222-40.000.

Goerke, Burkhard: *See—*
Durr, Heinrich; Richter, Hermann; Weber, Wendelin; Goerke, Burkhard; and Engler, Peter, 4,350,450, Cl. 400-124.000.

Golda, Eugene: *See—*
Shelnut, James; Golda, Eugene; Wilkes, Alan; and Shimazu, Kenichi, 4,350,753, Cl. 430-190.000.

Goldbach, William R., to General Electric Company. Separable electrical connector module. 4,350,406, Cl. 339-111.000.

Goldfarb, Adolph E.; and Goldfarb, Anita J., to Goldfarb, Adolph E. Preschool assembly toy. 4,349,984, Cl. 46-17.000.

Goldfarb, Anita J.: *See—*
Goldfarb, Adolph E.; and Goldfarb, Anita J., 4,349,984, Cl. 46-17.000.

Goldschild, Pierre H.; and Robert, Christian C., to Schlumberger Technology Corporation. Work over methods and apparatus. 4,350,205, Cl. 166-375.000.

Goldshtein, Boris G.: *See—*
Antipov, Georgy A.; Gelfand, Mikhail L.; Tsipenjuk, Yakov I.; Goldshtein, Boris G.; Lavnikov, Nikolai S.; Teres, Leonid N.; Urazhdin, Ivan I.; Yakubovsky, Petr S.; Boiko, Vitaly T.; Kalmykov, Anatoly M.; Minyashkin, Dmitry P.; and Stepanov, Mikhail M., 4,350,213, Cl. 173-93.600.

Goodman Manufacturing Corporation: *See—*
Zur, Henry C., 4,349,924, Cl. 5-68.000.

Goodwin, Robert F., to Foss Manufacturing Company, Inc. Reinforcing laminate. 4,350,732, Cl. 428-246.000.

Goodyear Aerospace Corporation: *See—*
Crossman, Richard L.; and Kirk, Richard L., 4,350,231, Cl. 188-218.0XL.

Goodyear Tire & Rubber Company, The: *See—*
Hampshire, William J., 4,350,196, Cl. 152-5.000.
Hopper, Roger J.; Sturm, Budd H.; and Geiser, Joseph F., 4,350,818, Cl. 548-166.000.

Gordon, Bernard M.; and Weedon, Hans J., to Analogic Corporation. Logarithmic analog-to-digital converter. 4,350,974, Cl. 340-347.0DA.

Gosnell, Jeffrey M.: *See—*
Yargus, Lloyd A.; Switzer, Lester W., Sr.; Allen, Gary N.; Elliott, Gary S.; Yargus, Larry D.; Lowry, William D.; Gosnell, Jeffrey M.; and Spires, Darrell J., 4,350,444, Cl. 366-141.000.

Goswami, Jagadish C.; and Parikh, Shridhar V., to Stauffer Chemical Company. Blend of internally plasticized vinyl chloride copolymer and polyurethane elastomer. 4,350,792, Cl. 525-129.000.

Gottling, Helmut; and Moller, Rudolf, to WABCO Steuerungstechnik GmbH & Co. Operating equipment for gate valves (passage valves). 4,350,182, Cl. 137-625.270.

Gouda, Kasim I. Frame for stereotactic surgery. 4,350,159, Cl. 128-303.00B.

Gowman, Lawrence P.: *See—*
Godek, James L.; and Gowman, Lawrence P., 4,350,034, Cl. 72-42.000.

Graeff, Norwood C.: *See—*
Bobb, Clifford F.; and Graeff, Norwood C., 4,350,855, Cl. 200-292.000.

Granda, Edward J.: *See—*
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,350,823, Cl. 560-120.000.

Grandia, Johannes; McChesney, William G.; Santini, Hugo A. E.; and Turk, Harold L., to International Business Machines Corporation. Holder for liquid phase epitaxial growth. 4,350,116, Cl. 118-500.000.

Grapha-Holding AG: *See—*
Muller, Hans, 4,350,327, Cl. 270-54.000.

Grasshoff, Michael J., to Polaroid Corporation. Process for preparing polymeric oximes. 4,350,801, Cl. 526-93.000.

Greco, Carl C.; and Triplett, Kelly B., to Stauffer Chemical Company. Method for preparing a magnesium halide support for catalysts. 4,350,612, Cl. 252-441.000.

Greenawalt, Eddie L.; Ray, Steve C.; and Garner, Daniels S., to Package Machinery Company. Sealing head. 4,350,003, Cl. 53-548.000.

Greenough, George K.; and Brown, Richard C., to National Research Development Corporation. Respirable particle sampling instruments. 4,350,507, Cl. 55-270.000.

Greer, William H. Vehicle identification and position signalling system in a public transportation system. 4,350,969, Cl. 340-23.000.

Gregoire, Michel; and Vuillemin, Jean C., to Lignes Telegraphiques et Telephoniques. Method for testing a digital data transmission line between two modems and a device for the application of said method. 4,351,059, Cl. 375-10.000.

Greiner, Leonard. Cold start characteristics of ethanol as an automobile fuel. 4,350,133, Cl. 123-550.000.

Griffith Laboratories, Limited, The: *See—*
Dyson, David V.; Lees, David H.; Fenn, Michael A. F.; and Darley, Kenneth S., 4,350,713, Cl. 426-243.000.

Griffiths, Ronald S.; and Searles, John E., to A.G. (Patents) Limited. Liquid dispenser meter. 4,350,265, Cl. 222-38.000.

Grimm, Wolfgang: *See—*
Henrichs, Paul; Haas, Peter; Hoppe, Hans-Georg; and Grimm, Wolfgang, 4,350,777, Cl. 521-110.000.

Grogler, Gerhard: *See—*
Rasshofer, Werner; Grogler, Gerhard; and Meyborg, Holger, 4,350,781, Cl. 521-149.000.

Grosscurt, Arnoldus C.: *See—*
Brouwer, Marius S.; and Grosscurt, Arnoldus C., 4,350,706, Cl. 424-322.000.

Groth, Hugh F.; and Duncan, L. Scot, to Delta, Inc. Kit for assembling toolbox adapted for installation in back of pickup truck and method of assembling the toolbox. 4,350,257, Cl. 220-4.00F.

Grove Truseal Valve Company: *See—*
Mueller, John H., 4,350,322, Cl. 251-229.000.

Gruber, Martin V.; and Doshi, Mahendra F., to Zurn Industries, Inc. Liquid spray nozzle. 4,350,302, Cl. 239-500.000.

Grunewalder, John F.: *See—*
Ostrowski, John S.; Grunewalder, John F.; and Castellucci, Nicholas T., 4,350,804, Cl. 525-327.300.

Grussaber, Rolf: *See—*
Vester, Ewald; Grussaber, Rolf; Kupper, Wolfgang; and Glatzhoefer, Horst, 4,349,964, Cl. 33-264.000.

GTE Laboratories Incorporated: *See—*
Smith, J. Thomas, 4,350,771, Cl. 501-97.000.

Guardian Industries Corporation: *See—*
Faulkner, Duane H.; and Chenoweth, Vaughn C., 4,350,516, Cl. 65-327.000.

Guilbeau, Karl G.: *See—*
Mosier, Benjamin; McCrary, Jack L.; and Guilbeau, Karl G., 4,350,601, Cl. 252-8.55R.

Gulf Research & Development Company: *See—*
Cronauer, Donald C.; and Bjorklund, Robert B., 4,350,609, Cl. 252-465.000.

Gunkel, Werner, to Merck Patent Gesellschaft mit Beschrankter Haftung. Separation column for liquid chromatography and sealing arrangement therefor. 4,350,595, Cl. 210-656.000.

Gupte, Arun R.; Kladders, Heinrich; and Struth, Helmut, to Boehringer Ingelheim GmbH. Device and process for drawing off very small quantities of powder. 4,350,049, Cl. 73-864.510.

Guschin, Alexandr E.: *See—*
Alexandrov, Vyacheslav S.; Guschin, Alexandr E.; Zavodov, Rudolf V.; Zhukova, Elena I.; Ivanov, Alexandr A.; Fofanova, Tatyana S.; Mikhailov, Evgeny I.; Dianov, Ivan M.; Luzin, Pavel M.; Sergeev, Igor A.; Pankratova, Lidia A.; Krylova, Vera E.; and Leibenzon, Semen A., 4,350,482, Cl. 425-83.100.

Gustafson, John A., Jr.: *See—*
Trusselle, William H.; and Gustafson, John A., Jr., 4,350,187, Cl. 141-90.000.

Guthrie, James. Tobacco stripper. 4,350,172, Cl. 131-322.000.

H. P. Hood, Inc.: *See—*
Hoffman, Louis S., 4,350,263, Cl. 220-359.000.

Haas, Peter: *See—*
Henrichs, Paul; Haas, Peter; Hoppe, Hans-Georg; and Grimm, Wolfgang, 4,350,777, Cl. 521-110.000.

Habib, Wagdi W., to Hollister Incorporated. Silica-containing protective adhesive paste for use with ostomy appliances. 4,350,785, Cl. 524-55.000.

Hackenberg, Hubert, to AGFA-Gevaert Aktiengesellschaft. Film transport arrangement for a camera. 4,350,425, Cl. 354-207.000.

Hacker, Josef. Free stall construction. 4,350,117, Cl. 119-27.000.

Hadley, Michael S.; and Blaney, Frank E., to Beecham Group Limited. Certain azabicyclocarboxamides and compositions containing same. 4,350,691, Cl. 424-244.000.

Haggar Company: *See—*
Off, Joseph W. A., 4,349,920, Cl. 2-247.000.

Hagiwara, Daijiro: *See—*
Hashimoto, Misashi; Hemmi, Keiji; Aratari, Matsuhiko; Takeno, Hidekazu; and Hagiwara, Daijiro, 4,350,694, Cl. 424-248.540.

Haire, Donal: *See—*
Richards, Kennith E., 4,350,287, Cl. 237-12.30A.

Hairsine, Peter W.: *See—*
Clements-Jewery, Stephen; Westwood, Robert; and Hairsine, Peter W., 4,350,697, Cl. 424-256.000.

Hakansson, Hakan B.; Persson, Lennart P. E.; and Wall, Berth-Ove G., to Gambro AB. Device for temperature measurement and a method for the manufacture of such a device. 4,349,958, Cl. 29-612.000.

Haley, Norman S. Batten setter. 4,350,279, Cl. 227-156.000.

Halifax Tool Company Limited: *See—*
Cox, Nigel B., 4,350,348, Cl. 277-199.000.

Hall, Alfred E., to Sigalos & Levine, P.C. Electronic logic game method and apparatus. 4,350,340, Cl. 273-153.00R.

Hall, Richard A.; and Bernier, Edward J., Jr., to Standard Oil Company (Indiana). Method to adhere acrylic films to styrenic polymers. 4,350,742, Cl. 428-520.000.

Hall, Stacy W.: *See—*
Coleman, William E.; and Hall, Stacy W., 4,350,932, Cl. 315-169.200.

Hall, William B., Jr. Parallel digital computer architecture. 4,351,025, Cl. 364-200.000.

Hall, William H.; and Saul, John R., to Micmix Audio Products, Inc. Reverberation apparatus. 4,350,845, Cl. 179-1.00J.

Haller, Berthold. Shutter blind assembly. 4,350,197, Cl. 160-166.00A.

Halliburton Company: *See*—
Peelman, Harold E., 4,350,888, Cl. 250-270.000.

Halloran, Michael T.: *See*—
Gilbert, Ian D.; Halloran, Michael T.; and Roos, Ermi, 4,350,292, Cl. 239-7.000.

Hamada, Hideo: *See*—
Suga, Masaaki; and Hamada, Hideo, 4,350,234, Cl. 192-4.00A.

Hamada, Isao; Nakayama, Hiroshi; Kawakami, Nobuyoshi; Azami, Hirotaka; Ikeda, Tadasu; Yukawa, Yasumasa; Mitani, Hiroshi; Ohmori, Takashi; Kimura, Masanobu; and Seno, Kohichi, to Hirachi, Ltd.; and Nippon Mining Co., Ltd. Centrifugal separator. 4,350,510, Cl. 55-349.000.

Hamano, Sachiyuki; Kitamura, Shinichi; Igarashi, Toshiji; and Nakajima, Yoshikage, to Eisai Co., Ltd. Cyclohexane derivatives, process for preparation thereof and medicines containing these cyclohexane derivatives. 4,350,705, Cl. 424-278.000.

Hamed, Gary R.: *See*—
Bohm, Georg G. A.; Hamed, Gary R.; and Vescelius, Lee E., 4,350,795, Cl. 525-194.000.

Hamilton, Bert, Jr., to Jet-It-Done, Inc. Cooking apparatus. 4,350,140, Cl. 126-276.000.

Hamilton, Joel A.: *See*—
Mahaffy, Reid A.; and Hamilton, Joel A., 4,349,999, Cl. 53-128.000.

Hammond, James A., to Colamco, Inc. Integral composite foam product and method. 4,350,734, Cl. 428-308.400.

Hampshire, William J., to Goodyear Tire & Rubber Company, The. Non-pneumatic structurally resilient integrated wheel-tire. 4,350,196, Cl. 152-5.000.

Hanacek, Josef: *See*—
Janirek, Ladislav; Hlavinka, Jaroslav; Hanacek, Josef; and Miculka, Zdenek, 4,350,029, Cl. 69-1.000.

Hanada, Kouji: *See*—
Shiratori, Takahisa; Tamura, Masaru; and Hanada, Kouji, 4,350,856, Cl. 200-306.000.

Hanada, Yoshihiro; and Tottori, Takafumi, to Minolta Camera Kabushiki Kaisha. Toner dispensing device. 4,350,269, Cl. 222-227.000.

Hanagata, Takayoshi; and Noda, Atsushi, to Canon Kabushiki Kaisha. Printing head mounting device. 4,350,448, Cl. 400-120.000.

Hanagata, Takayoshi; and Noda, Atsushi, to Canon Kabushiki Kaisha. Printing device. 4,350,987, Cl. 346-76.0PH.

Hanaoka, Keishiro: *See*—
Taguchi, Kazumasa; Isako, Hiroshi; Ikeda, Koichi; Honda, Keisuke; Kanemoto, Masaru; and Hanaoka, Keishiro, 4,350,523, Cl. 75-0.50R.

Hanford, Norris E. Exercise treadmill shock-absorbing improvement. 4,350,336, Cl. 272-69.000.

Hannan, Garnet M. U. Wheel means for container handling. 4,350,355, Cl. 280-28.500.

Hansen, James E.: *See*—
Oldershaw, Paul V.; Hansen, James E.; and Hinds, Walter E., 4,350,478, Cl. 417-417.000.

Hanula, Richard M.; and Kulieke, Fred C., Jr., to Midland-Ross Corporation. Rotary coupler with a specially configured pinhole. 4,350,256, Cl. 213-69.000.

Haque, Yusuf A.; and Blasco, Richard W., to American Microsystems, Inc. Dual bandwidth autozero loop for a voice frequency CODEC. 4,350,975, Cl. 340-347.0CC.

Hara, Takeshi: *See*—
Masuho, Yasuhiko; and Hara, Takeshi, 4,350,626, Cl. 260-112.50R.

Harada, Takeshi: *See*—
Sutoh, Shinji; Harada, Takeshi; and Kaneko, Shinichi, 4,350,286, Cl. 236-44.00A.

Harada, Tetsuya: *See*—
Koitabashi, Takeo; Matsuzaka, Syozi; Iijima, Toshifumi; and Harada, Tetsuya, 4,350,758, Cl. 430-567.000.

Harlan, Wayne E., to RCA Corporation. Self-limiting video signal peaking circuit. 4,350,995, Cl. 358-37.000.

Harlan, Wayne E., to RCA Corporation. Automatic video signal peaking control. 4,351,003, Cl. 358-166.000.

Harmsen, Lothar: *See*—
Bick, Klaus; Harmsen, Lothar; Zieschang, Jurgen; and Vennmann, Friedhelm, 4,351,055, Cl. 373-76.000.

Harnischfeger GmbH: *See*—
Blase, Helmut; Hogemann, Arend; and Schulze, Dieter, 4,350,255, Cl. 212-268.000.

Harries, David A.: *See*—
Ingram, Brian; Harries, David A.; and Natarajan, Ramamurthy, 4,350,230, Cl. 188-79.000.

Harrold, Ronald T., to Electric Power Research Institute, Inc. Ultrasonic fluid-atomizing cooled power transformer. 4,350,838, Cl. 174-15.00R.

Harsch, Klaus; and Schulzke, Peter, to Robert Bosch GmbH. Apparatus for driving electromagnetic devices, particularly electromagnetic injection valves in internal combustion engines. 4,350,132, Cl. 123-490.000.

Harsco Corporation: *See*—
Gallis, Anthony J., 4,350,318, Cl. 249-40.000.

Hartford Corporation, The: *See*—
Mayer, Nathan, 4,350,246, Cl. 206-210.000.

Hartinger, Edmund; Julke, Elias; and Sandmann, Harald, to Maschinenfabrik Meyer AG. Process for filtering and encapsulating radioactive particles. 4,350,620, Cl. 252-628.000.

Hartman, Gary L.: *See*—
Gay, Tom A.; Hartman, Gary L.; and Stein, Gunter, 4,351,027, Cl. 364-432.000.

Harvey, Bruce J.: *See*—
Casey, Gary L.; Harvey, Bruce J.; Hebert, Kenneth A.; and Eddy, William C., 4,350,135, Cl. 123-564.000.

Harvey, Kenneth; Hayes, Harry; and Morton, Anthony J., to Colgate-Palmolive Company. Dentifrice. 4,350,680, Cl. 424-52.000.

Hasegawa, Yo; Yasuda, Shigeru; and Kojima, Kunio, to Matsushita Electric Industrial Co., Ltd. Resistor elements. 4,350,741, Cl. 428-473.500.

Hash, Juel T., to Jorges, Shirley M., a part interest. Tufted pile fabric. 4,350,106, Cl. 112-410.000.

Hashimoto, Kinro: *See*—
Oyama, Motofumi; and Hashimoto, Kinro, 4,350,796, Cl. 525-233.000.

Hashimoto, Makoto: *See*—
Suzuki, Shigeru; Suzuki, Minoru; Suzuki, Koichi; Omi, Kyoji; Nagahara, Yasumori; Kagari, Yoshiharu; Hashimoto, Makoto; and Mori, Goro, 4,350,750, Cl. 430-125.000.

Hashimoto, Misashi; Hemmi, Keiji; Aratari, Matsuhiko; Takeno, Hidekazu; and Hagiwara, Daijiro, to Fujisawa Pharmaceutical Co., Ltd. Cephalosporin analogues and antimicrobial compositions. 4,350,694, Cl. 424-248.540.

Hashimoto, Noboru; and Akatsu, Mitsu, to JGC Corporation. Catalytic reactor. 4,350,665, Cl. 422-191.000.

Hashizume, Shigeyuki: *See*—
Fujii, Hiroo; Tanaka, Kiyoaki; Nakamura, Masashi; Okuno, Ryuzo; Hashizume, Shigeyuki; Katayama, Hideo; and Fujita, Tsutomu, 4,350,326, Cl. 266-201.000.

Hatanaka, Hideo: *See*—
Fukutome, Satoru; Hatanaka, Hideo; and Saito, Motoyuki, 4,351,041, Cl. 368-88.000.

Hattori, Kyo: *See*—
Kawata, Shoji; Hattori, Kyo; and Sakurai, Kazuhiro, 4,350,319, Cl. 251-65.000.

Hauck, Frederic P.; and Fox, Rita T., to E. R. Squibb & Sons, Inc. Antiarrhythmic tetrahydronaphthalene derivatives. 4,350,812, Cl. 544-79.000.

Hauni-Werke Korber & Co. K.G.: *See*—
Baier, Anton, 4,350,170, Cl. 131-84.00R.

Hauserman Ltd.: *See*—
Ball, Douglas C., 4,351,017, Cl. 362-147.000.

Havakawa, Yoshihiro: *See*—
Matsuda, Akira; Havakawa, Yoshihiro; Yasuda, Shigeo; Iwasaki, Motoaki; and Nishino, Hiroshi, 4,350,854, Cl. 200-61.250.

Hayasaka, Yoshiyuki; Ikeuchi, Ichiro; Matsumoto, Hajime; and Shikaya, Yukihiro, to Mitsubishi Jukogyo Kabushiki Kaisha; and Dainippon Printing Company Ltd. Device for enabling registry of operations in an apparatus for continuously forming containers filled with material. 4,349,997, Cl. 53-51.000.

Hayashi, Shigeki; and Kusakabe, Mitsuo, to Nusco Kabushiki Kaisha; and Kusakabe Denki Kabushiki Kaisha. Reciprocating travelling shear. 4,350,065, Cl. 83-287.000.

Hayashi, Yoshimasa: *See*—
Nakajima, Yasuo; Hayashi, Yoshimasa; Nagumo, Shin-ichi; and Yoshimura, Tooru, 4,350,129, Cl. 123-440.000.

Hayashi, Yukio: *See*—
Ishijima, Shizuo; Kiritani, Takeshi; and Hayashi, Yukio, 4,350,535, Cl. 106-308.00Q.

Hayes, Harry: *See*—
Harvey, Kenneth; Hayes, Harry; and Morton, Anthony J., 4,350,680, Cl. 424-52.000.

Hayes, William V.: *See*—
Childress, David L.; Hayes, William V.; and Poppe, Richard L., 4,350,830, Cl. 562-535.000.

Hays, Bill J. Electrical pin connector. 4,350,408, Cl. 339-149.00S.

Hayslett, David D.: *See*—
Schwartz, Henry D.; Krull, Irwin H.; Clement, Carl J.; Stengel, Frederick H.; and Hayslett, David D., 4,350,579, Cl. 204-195.00R.

Heberling, Walter; Muller, Wolfgang; Langenberg, Werner; Behrens, Gerhard; and Saul, Alfred, to Gewerkschaft Eisenhutte Westfalia. Plough transmission. 4,350,393, Cl. 299-50.000.

Hebert, Kenneth A.: *See*—
Casey, Gary L.; Harvey, Bruce J.; Hebert, Kenneth A.; and Eddy, William C., 4,350,135, Cl. 123-564.000.

Hedin, Jan S.; and Jarnestedt, Goran A., to Telefonaktiebolaget L M Ericsson. Method of phase synchronization in a synchronous data transmission system, and apparatus for carrying out the method. 4,351,061, Cl. 375-20.000.

Hedlund, Kenneth G.: *See*—
Johansson, Anne S.; Hogman, Claes F.; and Hedlund, Kenneth G., 4,350,585, Cl. 210-94.000.

Heimlich, Henry J. Respiratory exerciser. 4,350,167, Cl. 128-727.000.

Heinemann, Otto; Schmits, Heinz-Herbert; Philipp, Rainer; and Berger, Artur, to Krupp Polysius AG. Push grid. 4,350,244, Cl. 198-773.000.

Heinrich-Hertz-Institut fur Nachrichtentechnik Berlin GmbH: *See*—
Nobis, Rolf, 4,351,049, Cl. 370-62.000.

Heinrich, Richard, to Kaco GmbH & Co. Radial-shaft sealing rings with heat dissipation segments. 4,350,347, Cl. 277-153.000.

Heisner, Donald N.; and Bentivegna, Charles R., to Monsanto Company. Tire inspection system. 4,350,942, Cl. 318-626.000.

Heitzer, Helmut: *See*—
Beck, Gunther; Heitzer, Helmut; and Lurssen, Klaus, 4,350,520, Cl. 71-92.000.

Helgeland, Walter; Teverovsky, Alex; Kerwin, Kenneth H., II; and Chartier, Carl P., to Ferrofluidics Corporation. Apparatus for and method of handling crystals from crystal-growing furnaces. 4,350,560, Cl. 156-617.0SP.

Heller, Donald F., to Allied Corporation. Electronically induced multiphoton absorption. 4,350,577, Cl. 204-157.10R.

Hellmann, Wolf D., to Colortronic Reinhard & Co. KG. Gripper with serially pivoted fingers. 4,350,381, Cl. 294-88.000.

Helms, Harold R. Manually propelled lawn and garden cart. 4,350,366, Cl. 280-655.000.

Hemingway, Bruce: *See*—
Shah, Hasmukh R.; Jones, Thaddeus M.; and Hemingway, Bruce, 4,350,238, Cl. 194-1.00N.

Hemmi, Keiji: *See*—
Hashimoto, Misashi; Hemmi, Keiji; Aratari, Matsuhiko; Takeno, Hidekazu; and Hagiwara, Daijiro, 4,350,694, Cl. 424-248.540.

Henderlong, Dennis B.: *See*—
Kesling, Peter C.; and Henderlong, Dennis B., 4,350,487, Cl. 433-14.000.

Henocq, Emile: *See*—
Relyveld, Edgar R.; and Henocq, Emile, 4,350,686, Cl. 424-88.000.

Henrichs, Paul; Haas, Peter; Hoppe, Hans-Georg; and Grimm, Wolfgang, to Bayer Aktiengesellschaft. Impermeable molded articles of cellular polyurethane elastomers produced with organofunctional polysiloxane-derivatives and their use as spring elements. 4,350,777, Cl. 521-110.000.

Hensel, Reiner: *See*—
Albrecht, Ernst; Hensel, Reiner; Keller, Karl-Heinz; and Stahlschmitt, Horst, 4,350,105, Cl. 112-256.000.

Herman, John T.: *See*—
Dudrey, Denis J.; and Herman, John T., 4,350,282, Cl. 233-7.000.

Hermann, Joerg; Baier, Werner; and Breidbach, Josef, to Webasto-Werk W. Baier GmbH and Co. Fluid fuel heating system. 4,350,288, Cl. 237-12.30C.

Hermosin, Antonio: *See*—
Morell, Antoinette; and Hermosin, Antonio, 4,350,651, Cl. 264-65.000.

Herring, Chauncey, Jr.: *See*—
Astfalk, Gregory; Fowler, Lawrence A.; Herring, Chauncey, Jr.; and Szymczak, Thaddeus J., 4,351,030, Cl. 364-552.000.

Herrmann, Albert: *See*—
Florian, Rudolf; and Herrmann, Albert, 4,351,058, Cl. 373-155.000.

Herubel, Jean-Frederic, to N. Schlumberger & Cie. Method for recovering meat proteins remaining attached to the bones after the boning operation. 4,350,624, Cl. 260-112.00R.

Hesse, Wolfgang; Landauer, Franz; and Schmiedel, Klaus, to Hoechst Aktiengesellschaft. Process for the preparation of synthetic resins based on resorcinol compounds. 4,350,800, Cl. 525-480.000.

Hetherington, Robert D.; and Goelz, David W., to Binks Manufacturing Company. Pumping system for unstable fluids. 4,350,266, Cl. 222-40.000.

Hettinga, Siebolt: *See*—
McCambridge, James; and Hettinga, Siebolt, 4,350,193, Cl. 144-286.00R.

Hewlett-Packard Company: *See*—
Best, Allan I.; Bohley, Thomas K.; and Westlund, Ronald C., 4,350,953, Cl. 324-183.000.

Higashiyama, Kazuhiro, to Nissan Motor Company, Limited. Fail-safe control computer. 4,351,050, Cl. 371-12.000.

Higham, Peter, to Perkin-Elmer Limited. Personal gas monitor. 4,350,037, Cl. 73-23.000.

Hikasa, Tadashi: *See*—
Baba, Kazuo; Wakatsuki, Kizuku; and Hikasa, Tadashi, 4,350,802, Cl. 526-142.000.

Hilgemann, Marvin E.: *See*—
Kotula, Frank T.; and Hilgemann, Marvin E., 4,349,988, Cl. 47-1.500.

Hill, David T.: *See*—
Gleason, John G.; and Hill, David T., 4,350,698, Cl. 424-258.000.

Hill, Ian L., to T.B.C. Pty. Limited. R.F. switched amplifier and A.M. modulator. 4,350,962, Cl. 332-60.000.

Hill, Loren G. Apparatus for locating an aquatic environment with a pH preferred by Largemouth and Striped Bass fish. 4,349,976, Cl. 43-4.000.

Hilson, David G.; Johnson, Gary W.; and Schoonejongen, Ronald J., to Electro Materials Corp. of America. Thick film conductors for use in microelectronic packaging. 4,350,618, Cl. 252-514.000.

Hinchcliffe, Dennis; Starkey, Stanley V.; and Stone, William A., to Molins Limited. Conveyor systems for cigarettes and similar rod-like articles. 4,350,242, Cl. 198-605.000.

Hinds, Walter E.: *See*—
Oldershaw, Paul V.; Hansen, James E.; and Hinds, Walter E., 4,350,478, Cl. 417-417.000.

Hirachi, Ltd.: *See*—
Hamada, Isao; Nakayama, Hiroshi; Kawakami, Nobuyoshi; Azami, Hirotaka; Ikeda, Tadasu; Yukawa, Yasumasa; Mitani, Hiroshi; Ohmori, Takashi; Kimura, Masanobu; and Seno, Kohichi, 4,350,510, Cl. 55-349.000.

Hirahara, Hiroshi: *See*—
Tsujimoto, Eiichi; Hirahara, Hiroshi; and Matsumoto, Makoto, 4,350,004, Cl. 53-570.000.

Hiramatsu, Yasuzo: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,350,700, Cl. 424-263.000.

Hirayama, Masao: *See*—
Zenbayashi, Katsuaki; Morinaga, Akio; Hirayama, Masao; and Morita, Akira, 4,350,548, Cl. 156-156.000.

Hirose, Noboru, to Brother Kogyo Kabushiki Kaisha. Step feed drilling machine. 4,350,212, Cl. 173-6.000.

Hirsig, Alan R.: *See*—
Worrell, G. Richard; and Hirsig, Alan R., 4,350,828, Cl. 562-486.000.

Hisaki, Masakatu: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,350,700, Cl. 424-263.000.

Hisaki, Tomoko: *See*—
Mizushima, Yoshihiko; Takeda, Akitsu; Yoshikawa, Akira; Ochi, Osamu; and Hisaki, Tomoko, 4,350,541, Cl. 148-188.000.

Hishinuma, Yukio: *See*—
Matsuda, Shimpei; Kato, Akira; Mori, Toshikatsu; Kumagai, Teruo; Hishinuma, Yukio; Akimoto, Hidetoshi; and Nakajima, Fumito, 4,350,670, Cl. 423-244.000.

Hitachi Koki Co., Ltd.: *See*—
Sagae, Syoji; Matsuda, Yasumasa; Kasahara, Masatoshi; and Suzuki, Masayoshi, 4,350,989, Cl. 346-140.00R.

Hitachi, Ltd.: *See*—
Akiyama, Masatoshi; Kitamura, Shigeki; Tetsu, Junichi; and Nakazato, Koichi, 4,350,514, Cl. 65-36.000.
Matsuda, Shimpei; Kato, Akira; Mori, Toshikatsu; Kumagai, Teruo; Hishinuma, Yukio; Akimoto, Hidetoshi; and Nakajima, Fumito, 4,350,670, Cl. 423-244.000.
Misono, Masayoshi, 4,350,924, Cl. 313-441.000.
Sagae, Syoji; Matsuda, Yasumasa; Kasahara, Masatoshi; and Suzuki, Masayoshi, 4,350,989, Cl. 346-140.00R.
Sakata, Kazuhiro; Yuminaka, Takeo; Nakazato, Masao; Yoneda, Kenji; Kuzunuki, Soshiro; and Katayama, Yasunori, 4,350,225, Cl. 187-29.00R.
Sasaki, Kouji; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Takemori, Satoshi; and Ikemoto, Norio, 4,351,052, Cl. 372-58.000.
Tojo, Kenji; Ikegawa, Masato; Shiibayashi, Masao; and Imai, Masaya, 4,350,479, Cl. 418-55.000.
Yamada, Takahiro, 4,350,986, Cl. 346-75.000.
Yanagisawa, Syozo, 4,350,136, Cl. 123-568.000.

Hiyoshi, Kazuhiko; Matsuura, Norio; Matsugichi, Michiharu; Onofusa, Norio; and Nishikage, Tadao, to Asahi-Dow Limited. Aqueous dispersions of vinylidene chloride resins. 4,350,622, Cl. 524-831.000.

Hlavinka, Jaroslav: *See*—
Janirek, Ladislav; Hlavinka, Jaroslav; Hanacek, Josef; and Miculka, Zdenek, 4,350,029, Cl. 69-1.000.

Ho, Dar-Veig: *See*—
Steenblik, Richard A.; and Ho, Dar-Veig, 4,350,412, Cl. 350-292.000.

Ho, David S.: *See*—
Choate, William C.; and Ho, David S., 4,351,004, Cl. 358-213.000.

Hoadley, Arthur W., to Western Michigan University, The Board of Trustees of. Wing mounted stall condition detector. 4,350,314, Cl. 244-1.00R.

Hochtemperatur-Reaktorbau GmbH: *See*—
Schwiers, Hans-Georg; and Schoening, Josef, 4,349,991, Cl. 52-21.000.

Hoechst Aktiengesellschaft: *See*—
Fischer, Hannes; and Plum, Helmut, 4,350,809, Cl. 528-361.000.
Hesse, Wolfgang; Landauer, Franz; and Schmiedel, Klaus, 4,350,800, Cl. 525-480.000.
Hoffmann, Bernd; Jung, Siegfried; and Semmler, Hans-Joachim, 4,350,206, Cl. 169-47.000.
Kuchler, Manfred; Duve, Gunther; and Ebigt, Joachim, 4,350,782, Cl. 523-334.000.
Lind, Erwin, 4,350,748, Cl. 430-49.000.
Molter, Michael; and Kloss, Gerhard, 4,350,674, Cl. 424-1.000.
Schornig, Eberhard, 4,349,932, Cl. 15-77.000.
Schroter, Herbert, 4,350,438, Cl. 355-68.000.
Springer, Hartmut, 4,350,632, Cl. 260-314.500.

Hoefle, Milton L.; and Bobowski, George, to Warner-Lambert Company. Substituted acyl derivatives of octahydro-1H-indole-2-carboxylic acids. 4,350,704, Cl. 424-274.000.

Hofbauer, John, to Die-Craft Metal Products, Inc. Component retaping machine with tooth engaging means. 4,350,556, Cl. 156-541.000.

Hoffa, Jack, to Bentley Laboratories. Atraumatic blood access device valve. 4,350,157, Cl. 128-214.00R.

Hoffman, Louis S., to H. P. Hood, Inc. Package having sealed closing means. 4,350,263, Cl. 220-359.000.

Hoffmann, Bernd; Jung, Siegfried; and Semmler, Hans-Joachim, to Hoechst Aktiengesellschaft. Fire extinguishing foam concentrate and its application. 4,350,206, Cl. 169-47.000.

Hoge, William H., to Biax Fiberfilm. Process for producing highly porous thermoplastic films. 4,350,655, Cl. 264-145.000.

Hogemann, Arend: *See*—
Blase, Helmut; Hogemann, Arend; and Schulze, Dieter, 4,350,255, Cl. 212-268.000.

Hogman, Claes F.: *See*—
Johansson, Anne S.; Hogman, Claes F.; and Hedlund, Kenneth G., 4,350,585, Cl. 210-94.000.

Holben, Eugene F., to Conometer Corporation. Viscosity regulating apparatus and method. 4,350,285, Cl. 236-1.00R.
Holland, David; and Milner, David J., to Imperial Chemical Industries Limited. Chiral sugar complexes. 4,350,811, Cl. 536-18.000.
Hollister Incorporated: *See*—
Habib, Wagdi W., 4,350,785, Cl. 524-55.000.
Holmes, Arthur S.; and Ryan, James M., to Koch Process Systems, Inc. Distillative separation of carbon dioxide from light hydrocarbons. 4,350,511, Cl. 62-17.000.
Holmes, James C., to Raychem Corporation. Heat-recoverable pipeline termination plug. 4,350,183, Cl. 138-89.000.
Holt, James L.; and Otka, Robert P., to Outboard Marine Corporation. Digital read-out meter circuit and tachometer with variable meter update rate using an up/down counter means. 4,350,952, Cl. 324-166.000.
Holzapfel, Immanuel, to Daimler-Benz Aktiengesellschaft. Combustion chamber for a gas turbine. 4,350,009, Cl. 60-39.230.
Holzhauser, Ronald C.; McGlen, James A.; and Russel, Matthew J., to Eastman Kodak Company. Sheet feeding apparatus. 4,350,329, Cl. 271-9.000.
Hombak Maschinenfabrik GmbH u. Conkg: *See*—
Riedl, Reinhold, 4,350,191, Cl. 144-172.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ban, Keisuke; and Daimaru, Akimasa, 4,350,056, Cl. 74-579.00E.
Honda, Shoichi, 4,350,126, Cl. 123-315.000.
Honda, Katsuhisa: *See*—
Shirono, Junkichi; and Honda, Katsuhisa, 4,350,098, Cl. 108-6.000.
Honda, Keisuke: *See*—
Taguchi, Kazumasa; Isako, Hiroshi; Ikeda, Koichi; Honda, Keisuke; Kanemoto, Masaru; and Hanaoka, Keishiro, 4,350,523, Cl. 75-0.50R.
Honda, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Internal combustion engine. 4,350,126, Cl. 123-315.000.
Honeywell Inc.: *See*—
Agarwala, Poonam; and Zansky, Zoltan, 4,350,933, Cl. 315-278.000.
Gay, Tom A.; Hartman, Gary L.; and Stein, Gunter, 4,351,027, Cl. 364-432.000.
Mobarry, John W., 4,350,166, Cl. 128-664.000.
Nelson, Marvin D., 4,350,966, Cl. 337-302.000.
van Dyke, Martin J.; and Fahley, Jerome A., 4,350,039, Cl. 73-304.00C.
Honeywell Information Systems Inc.: *See*—
Bradley, John J.; and Franklin, Benjamin S., 4,351,024, Cl. 364-200.000.
Petryk, Edward M., Jr., 4,350,973, Cl. 340-347.0DD.
Honna, Takaji: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,350,700, Cl. 424-263.000.
Hoover Company, The: *See*—
Lorson, Emmett D.; and Minton, Keith G., 4,349,936, Cl. 15-366.000.
Hopkins, Grant; and Cantrell, Mark. Display rack. 4,350,252, Cl. 211-40.000.
Hoppe, Hans-Georg: *See*—
Henrichs, Paul; Haas, Peter; Hoppe, Hans-Georg; and Grimm, Wolfgang, 4,350,777, Cl. 521-110.000.
Hopper, Roger J., Sturm, Budd H.; and Geiser, Joseph F., to Goodyear Tire & Rubber Company, The. Preparation of 2-(isopropylsulfinyl)-benzothiazole. 4,350,818, Cl. 548-166.000.
Hornauer, Klaus-Peter: *See*—
Kopp, Reiner; and Hornauer, Klaus-Peter, 4,350,035, Cl. 72-53.000.
Horton, Gary B. Reamer. 4,350,204, Cl. 166-175.000.
Hoshino, Hitoshi: *See*—
Takada, Tadakazu; Tokitomo, Kazuo; and Hoshino, Hitoshi, 4,350,563, Cl. 156-643.000.
Hoshito, Kazuo: *See*—
Imai, Nobuhiro; Kono, Kimio; Hoshito, Kazuo; Kiyohara, Takehiko; and Sato, Hideaki, 4,351,005, Cl. 358-300.000.
Hosokawa, Motoyuki: *See*—
Isogai, Nobuo; Okawa, Takashi; Hosokawa, Motoyuki; Watanabe, Toshiyasu; and Wakui, Natsuko, 4,350,668, Cl. 423-139.000.
Hough, Louis E.: *See*—
DeVigili, Walter J.; and Hough, Louis E., 4,350,365, Cl. 280-605.000.
Howard, Frank H.: *See*—
Rowe, Eugene H.; and Howard, Frank H., 4,350,789, Cl. 525-31.000.
Howard, Jerry W.: *See*—
Shadden, Oliver W.; and Howard, Jerry W., 4,350,210, Cl. 172-143.000.
Howell, Stephen L., to Kimball International, Inc. Automatic bass generator for electronic organ. 4,350,069, Cl. 84-1.030.
Hoya Lens Corporation: *See*—
Yanagisawa, Yasuo; and Mitsui, Yoshiaki, 4,350,877, Cl. 235-70.00A.
Huang, I-Der, to Exxon Research & Engineering Co. Process for the manufacture of styrene. 4,350,825, Cl. 562-406.000.
Huang, Shih L.; McQuillen, Edward J.; and Richey, Robert J., Jr., to United States of America, Navy. Cross reinforcement in a graphite-epoxy laminate. 4,350,728, Cl. 428-105.000.
Huber, Bernhard, to Bodenseewerk Perkin-Elmer & Co. GmbH. Method of fabricating graphite tube. 4,350,718, Cl. 427-181.000.
Hudson, Raymond A. Pulsating spray nozzle. 4,350,158, Cl. 128-224.000.
Hughes, Richard H., to RCA Corporation. Electron gun with balanced lens lips to reduce astigmatism. 4,350,923, Cl. 313-414.000.
Hughett, Paul D., to Peterson/Puritan, Inc. Water-in-oil emulsions. 4,350,605, Cl. 252-305.000.
Hurlong, Granville W., Jr.: *See*—
Erwin, Louis R.; and Hurlong, Granville W., Jr., 4,350,301, Cl. 239-453.000.
Hwa, Chih M.: *See*—
Cuisia, Dionisio G.; and Hwa, Chih M., 4,350,606, Cl. 252-392.000.
Hyster Company: *See*—
Schmelzer, Lynn A.; and Fouser, W. Thomas, 4,350,460, Cl. 404-117.000.
IBM Patent Operations: *See*—
Schoenlein, William J., 4,350,454, Cl. 400-234.000.
Ichimura, Kunihiro. Terephthaldialdehyde monoacetal and method for manufacture thereof. 4,350,833, Cl. 568-433.000.
ICI Americas Inc.: *See*—
Shapiro, Howard S., 4,350,814, Cl. 546-84.000.
Ide, Yuuichi: *See*—
Kuwabara, Eiji; Sakata, Takayoshi; Kawauchi, Noboru; Ide, Yuuichi; and Matsuo, Takeshi, 4,350,023, Cl. 62-176.00E.
Ideal Industries, Inc.: *See*—
Isham, Leonard E.; Peplow, Marvin J.; Sandy, Julius W.; and ViPond, Clyde M., 4,350,061, Cl. 81-9.510.
Michaels, Leonard H., 4,350,840, Cl. 174-65.0SS.
Scott, William J., 4,350,841, Cl. 174-87.000.
Igarashi, Toshiji: *See*—
Hamano, Sachiyuki; Kitamura, Shinichi; Igarashi, Toshiji; and Nakajima, Yoshikage, 4,350,705, Cl. 424-278.000.
Igarashi, Yoshiaki: *See*—
Kato, Matsuo; Ohtsuki, Tomonari; Igarashi, Yoshiaki; Saito, Tsukasa; and Suzuki, Toshiaki, 4,350,409, Cl. 339-186.00M.
Igashira, Toshihiko: *See*—
Yoshinaga, Toru; Igashira, Toshihiko; Mori, Kouichi; Kawai, Hisasi; and Morino, Seiji, 4,350,137, Cl. 123-617.000.
Iguchi, Chojiro H.: *See*—
Nagai, Shosuke; Kato, Toshio; Iguchi, Chojiro H.; Kawashima, Nobuyuki; Mita, Ryuichi; Yamaguchi, Akihiro; and Takano, Takao, 4,350,643, Cl. 260-465.700.
Ihlenburg, Rainer: *See*—
Redlich, Horst; Borchard, Heinz; and Ihlenburg, Rainer, 4,351,047, Cl. 369-270.000.
Iijima, Toshifumi: *See*—
Koitabashi, Takeo; Matsuzaka, Syozi; Iijima, Toshifumi; and Harada, Tetsuya, 4,350,758, Cl. 430-567.000.
Ikeda, Koichi: *See*—
Taguchi, Kazumasa; Isako, Hiroshi; Ikeda, Koichi; Honda, Keisuke; Kanemoto, Masaru; and Hanaoka, Keishiro, 4,350,523, Cl. 75-0.50R.
Ikeda, Tadasu: *See*—
Hamada, Isao; Nakayama, Hiroshi; Kawakami, Nobuyoshi; Azami, Hirotaka; Ikeda, Tadasu; Yukawa, Yasumasa; Mitani, Hiroshi; Ohmori, Takashi; Kimura, Masanobu; and Seno, Kohichi, 4,350,510, Cl. 55-349.000.
Ikegawa, Masato: *See*—
Tojo, Kenji; Ikegawa, Masato; Shiibayashi, Masao; and Imai, Masaya, 4,350,479, Cl. 418-55.000.
Ikemoto, Norio: *See*—
Sasaki, Kouji; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Takemori, Satoshi; and Ikemoto, Norio, 4,351,052, Cl. 372-58.000.
Ikeuchi, Ichiro: *See*—
Hayasaka, Yoshiyuki; Ikeuchi, Ichiro; Matsumoto, Hajime; and Shikaya, Yukihiro, 4,349,997, Cl. 53-51.000.
Illinois Tool Works Inc.: *See*—
Dewey, George G., 4,349,929, Cl. 7-158.000.
Patis, Bruce L., 4,350,885, Cl. 250-231.00R.
Peterson, Francis C., 4,349,963, Cl. 30-347.000.
Imai, Ichiro; Furuya, Takashi; Ando, Narumi; and Kitajima, Satoyuki, to Nippon Steel Corporation. Method for producing steel strip for tin plate and tin-free steel plate in various temper grades. 4,350,538, Cl. 148-12.00D.
Imai, Masaya: *See*—
Tojo, Kenji; Ikegawa, Masato; Shiibayashi, Masao; and Imai, Masaya, 4,350,479, Cl. 418-55.000.
Imai, Nobuhiro; Kono, Kimio; Hoshito, Kazuo; Kiyohara, Takehiko; and Sato, Hideaki, to Canon Kabushiki Kaisha. Recording apparatus. 4,351,005, Cl. 358-300.000.
Imanaka, Ryoichi; and Tsuji, Seizou, to Matsushita Electric Industrial Co., Ltd. Recording system using disk-shaped recording medium. 4,351,044, Cl. 369-43.000.
Imanishi Flexible Tube Mfg. Co., Ltd.: *See*—
Nishikawa, Hideo, 4,350,874, Cl. 219-400.000.
Imbert, Leon A. Combined dice and card game apparatus. 4,350,339, Cl. 273-148.00A.
Imperial Chemical Industries Limited: *See*—
Edwards, Philip N.; and McMenim, Michael E., 4,350,826, Cl. 562-444.000.
Holland, David; and Milner, David J., 4,350,811, Cl. 536-18.000.
Imphy S.A.: *See*—
Lagarde, Pierre, 4,350,883, Cl. 235-435.000.
Industrial Fasteners Corp.: *See*—
Lovisek, Louis J., 4,350,465, Cl. 411-186.000.
Industrie Pirelli S.p.A.: *See*—
Brollo, Aurelio, 4,350,374, Cl. 285-132.000.

Ing. C. Olivetti & C., S.p.A.: *See*—
Berton, Marcello; and Bertozzi, Dino, 4,350,399, Cl. 312-138.00R.
Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Kolb, Eugen; and Srock, Rainer, 4,350,367, Cl. 280-756.000.
Ingenierbureau "Essex" B.V.: *See*—
Esselink, Abraham J., 4,350,500, Cl. 55-26.000.
Ingram, Brian; Harries, David A.; and Natarajan, Ramamurthy, to Girling Limited. Drum brakes for vehicles. 4,350,230, Cl. 188-79.000.
Inmos Corporation: *See*—
Eaton, Sargent S., Jr.; and Wooten, David R., 4,351,034, Cl. 365-189.000.
Inoshita, Yasushi: *See*—
Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, 4,350,289, Cl. 237-12.30A.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,350,863, Cl. 219-69.00P.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. High-frequency power feeder circuitry and supply for electrical discharge machining. 4,350,863, Cl. 219-69.00P.
Inoue, Shinichiro: *See*—
Uenosono, Chikasa; Okada, Takao; Matsuki, Junya; Naito, Tadashi; Inoue, Shinichiro; and Takahashi, Masaki, 4,350,947, Cl. 322-17.000.
Inoue, Tadao: *See*—
Morihisa, Mitsuo; and Inoue, Tadao, 4,351,021, Cl. 363-49.000.
Inoue, Tokuta: *See*—
Kanda, Mutsumi; Nakanishi, Kiyoshi; and Inoue, Tokuta, 4,350,125, Cl. 123-261.000.
Institut Francais du Petrole: *See*—
Rojey, Alexandre, 4,350,020, Cl. 62-93.000.
Institut National de la Recherche Agronomique: *See*—
Pardon, Pierre; Lantier, Frederic; Marly, Jose; and Bourgy, Gerard, 4,350,684, Cl. 424-92.000.
Institut National de la Sante et de la Recherche Medicale: *See*—
Nicolas, Jean-Claude; Terouanne, Beatrice; Descomps, Bernard; and Crastes de Paulet, Andre, 4,350,760, Cl. 435-7.000.
Institut Pasteur: *See*—
Relyveld, Edgar R.; and Henocq, Emile, 4,350,686, Cl. 424-88.000.
International Business Machines Corporation: *See*—
Chow, Chao-Kong; Liu, Chao-Ning; and Wang, Sherman S., 4,350,045, Cl. 73-607.000.
Countryman, Gerald P.; and Findlay, Ronald G., 4,350,449, Cl. 400-120.000.
Dials, Edward N.; and Kightlinger, Drew A., 4,350,452, Cl. 400-208.000.
Field, Thomas R.; Jagodzinski, Peter F.; King, James F.; and Schaefer, John O., 4,350,453, Cl. 400-208.000.
Frieser, Rudolf G.; Ma, William H.; Ozols, Gunars M.; and Zingerman, Bryant N., 4,350,578, Cl. 204-192.00R.
Grandia, Johannes; McChesney, William G.; Santini, Hugo A. E.; and Turk, Harold L., 4,350,116, Cl. 118-500.000.
Johnson, William S.; and Knepper, Ronald W., 4,350,991, Cl. 357-23.000.
Moore, Daniel J.; and Pascoe, Robert A., 4,350,455, Cl. 400-279.000.
Richard, Maurice E.; and Winarski, Daniel J., 4,350,309, Cl. 242-68.300.
International Flavors & Fragrances Inc.: *See*—
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,350,733, Cl. 428-290.000.
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,350,823, Cl. 560-120.000.
International Paper Company: *See*—
Lisnyansky, Khaim, 4,350,889, Cl. 378-46.000.
International Standard Electric Corporation: *See*—
Drake, Cyril F., 4,350,675, Cl. 424-1.000.
Parfree, Colin S.; and Worthington, Peter, 4,350,046, Cl. 73-768.000.
International Telephone and Telegraph Corporation: *See*—
Blakeley, James, 4,350,350, Cl. 277-207.00A.
Johnson, Charles B.; and Abraham, Jimmy M., 4,350,919, Cl. 313-99.000.
Meece, Meredith W.; and Paget, Win W., 4,350,475, Cl. 417-238.000.
Mohiuddin, Gulam, 4,350,739, Cl. 428-425.100.
Treiber, Robert, 4,351,060, Cl. 375-12.000.
Internationale Octrooi Maatschappij "Octropa" B.V.: *See*—
Rek, Johannes H. M., 4,350,715, Cl. 426-570.000.
Inuzuka, Tsuneki: *See*—
Tanioka, Hiroshi; Ishida, Masato; and Inuzuka, Tsuneki, 4,350,439, Cl. 355-14.0SH.
Ipsen, Peter G.: *See*—
Kalan, Gary L.; and Ipsen, Peter G., 4,350,345, Cl. 277-3.000.
Isako, Hiroshi: *See*—
Taguchi, Kazumasa; Isako, Hiroshi; Ikeda, Koichi; Honda, Keisuke; Kanemoto, Masaru; and Hanaoka, Keishiro, 4,350,523, Cl. 75-0.50R.
Isham, Leonard E.; Peplow, Marvin J.; Sandy, Julius W.; and ViPond, Clyde M., to Ideal Industries, Inc. Wire stripping mechanism. 4,350,061, Cl. 81-9.510.
Ishida, Masato: *See*—
Tanioka, Hiroshi; Ishida, Masato; and Inuzuka, Tsuneki, 4,350,439, Cl. 355-14.0SH.
Ishiguro, Jiro: *See*—
Watanabe, Nobuatsu; Kondo, Teruhisa; and Ishiguro, Jiro, 4,350,576, Cl. 204-101.000.
Ishihara, Masamitsu. Method and mechanism for constant-measure feed of rod materials. 4,350,033, Cl. 72-24.000.
Ishii, Koji, to Ryobi Ltd. Image position adjusting device for printing machine. 4,350,093, Cl. 101-217.000.
Ishijima, Shizuo; Kiritani, Takeshi; and Hayashi, Yukio, to Asahi Kasei Kogyo Kabushiki Kaisha. Water-dispersible paste composition of metal powder. 4,350,535, Cl. 106-308.00Q.
Ishima, Takaharu, to Yamaha Hatsudoki Kabushiki Kaisha. Snowmobile frame with corner-mounted dampers. 4,350,221, Cl. 180-190.000.
Ishiyama, Shozo, to Konishiroku Photo Industry Co., Ltd. Compact zoom lens. 4,350,416, Cl. 350-427.000.
Isogai, Nobuo; Okawa, Takashi; Hosokawa, Motoyuki; Watanabe, Toshiyasu; and Wakui, Natsuko, to Mitsubishi Gas Chemical Company, Inc. Recovery of cobalt component from 3-pentenoic ester synthesis. 4,350,668, Cl. 423-139.000.
Itagaki, Hidehiko; and Suzuki, Yuji, to Komatsu Zenoah Co. Cutting down machine. 4,349,962, Cl. 30-276.000.
Itagaki, Takaharu; and Ouchi, Hidenaga, to Mitsubishi Chemical Industries, Limited. Weakly acidic cation exchange resin and process for producing same. 4,350,773, Cl. 521-31.000.
Italtel Societa Italiana Telecomunicazioni S.p.A.: *See*—
Leti, Andrea; and Valacca, Enrico, 4,351,020, Cl. 363-26.000.
Ito, Hiroshi; and Saito, Kazuo, to Tokico Ltd. Disc brake having a slidably supported caliper. 4,350,229, Cl. 188-73.450.
Ito, Jinichi: *See*—
Miyazaki, Kiyoshi; Takeuchi, Tsuneto; Ito, Jinichi; and Ashibe, Hiroo, 4,350,937, Cl. 318-331.000.
Ito, Yoshiaki: *See*—
Shimokawa, Wataru; Ito, Yoshiaki; Kobayashi, Koichi; Fukumori, Katuaki; and Iwase, Nobukazu, 4,350,788, Cl. 524-309.000.
Ito, Yoshikazu: *See*—
Shindo, Takemasa; Ito, Yoshikazu; and Arai, Kenichiro, 4,350,907, Cl. 310-37.000.
ITT Industries, Inc.: *See*—
Luepertz, Hans-Henning, 4,350,228, Cl. 188-71.900.
Lupertz, Hans-Henning, 4,350,395, Cl. 303-6.00C.
Thiel, Rudolf, 4,350,076, Cl. 91-369.00A.
Young, John M.; and Scovell, Peter D., 4,350,537, Cl. 148-1.500.
Ivanov, Alexandr A.: *See*—
Alexandrov, Vyacheslav S.; Guschin, Alexandr E.; Zavodov, Rudolf V.; Zhukova, Elena I.; Ivanov, Alexandr A.; Fofanova, Tatyana S.; Mikhailov, Evgeny I.; Dianov, Ivan M.; Luzin, Pavel M.; Sergeev, Igor A.; Pankratova, Lidia A.; Krylova, Vera E.; and Leibenzon, Semen A., 4,350,482, Cl. 425-83.100.
Ivey, John S.: *See*—
Miller, Alan L.; and Ivey, John S., 4,350,058, Cl. 74-866.000.
Iwamoto, Hisao; and Wakatsuki, Noboru, to Fujitsu Limited. Surface acoustic wave device. 4,350,963, Cl. 333-151.000.
Iwasaki, Motoaki: *See*—
Matsuda, Akira; Havakawa, Yoshihiro; Yasuda, Shigeo; Iwasaki, Motoaki; and Nishino, Hiroshi, 4,350,854, Cl. 200-61.250.
Iwase, Nobukazu: *See*—
Shimokawa, Wataru; Ito, Yoshiaki; Kobayashi, Koichi; Fukumori, Katuaki; and Iwase, Nobukazu, 4,350,788, Cl. 524-309.000.
Iwashita, Tomonori; and Fukushima, Tadahide, to Canon Kabushiki Kaisha. Camera assembly with automatic winding mechanism. 4,350,424, Cl. 354-173.000.
Izumi, Jun; and Murakami, Nobuaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Process for controlling nitrogen oxides in exhaust gases. 4,350,669, Cl. 423-235.000.
Izumi, Masao, to Nissan Motor Company, Limited. Refrigerant evaporator. 4,350,025, Cl. 62-285.000.
J. E. Myles, Inc.: *See*—
Myles, J. Edgar, 4,350,091, Cl. 100-271.000.
J. Eberspacher: *See*—
Gaysert, Gerhard, 4,350,664, Cl. 422-179.000.
J. M. Ney Company, The: *See*—
Schaffer, Stephen P., 4,350,526, Cl. 75-134.00B.
Jackes-Evans Manufacturing Company: *See*—
Miller, Joseph N., 4,350,141, Cl. 126-287.000.
Jackson, Dale E., to Carrier Corporation. Cascaded fin winding machine control and method. 4,350,936, Cl. 318-7.000.
Jackson, Jasper A.; and Cooper, Richard K., to United States of America, Energy. Magnetic resonance apparatus. 4,350,955, Cl. 324-303.000.
Jackson, Winston J., Jr.; and Darnell, William R., to Eastman Kodak Company. Process for the preparation of poly(ester-carbonates). 4,350,805, Cl. 528-271.000.
Jagodzinski, Peter F.: *See*—
Field, Thomas R.; Jagodzinski, Peter F.; King, James F.; and Schaefer, John O., 4,350,453, Cl. 400-208.000.
James Howden Australia Pty. Limited: *See*—
Stephenson, Robert G., 4,350,100, Cl. 110-203.000.
Janicke, Johann; and Girardin, Roger, to Ateliers des Charmilles, S.A. Traveling wire EDM apparatus with automatic wire rethreading mechanism. 4,350,864, Cl. 219-69.00W.
Janirek, Ladislav; Hlavinka, Jaroslav; Hanacek, Josef; and Miculka, Zdenek, to Strojosvit. Apparatus for de-fleshing skins or hides. 4,350,029, Cl. 69-1.000.
Japan Foundation for Artificial Organs: *See*—
Malchesky, Paul S.; and Nose, Yukihiko, 4,350,156, Cl. 128-214.00R.

Jarnestedt, Goran A.: *See*—
Hedin, Jan S.; and Jarnestedt, Goran A., 4,351,061, Cl. 375-20.000.
Jarrell, Donald, to Jarrell, Donald; Logan, John G.; and Carpenter, Richard H., a part interest. Sewage treatment system. 4,350,587, Cl. 210-151.000.
Jarvis, Wilbur W.: *See*—
Dingler, Geoffrey L.; Jarvis, Wilbur W.; and Spiegel, Raymond W., 4,350,306, Cl. 241-46.150.
Jasper, William J., to Burroughs Corporation. Audio analog voltmeter. 4,350,951, Cl. 324-133.000.
Jayaraman, Anantharaman: *See*—
Vidal, Frederick D.; and Jayaraman, Anantharaman, 4,350,709, Cl. 426-319.000.
Jenkins, Jesse F.: *See*—
Zenner, Dennis W.; and Jenkins, Jesse F., 4,350,357, Cl. 280-79.300.
Jensen, Dal H.: *See*—
Barnard, Ralston W.; and Jensen, Dal H., 4,350,887, Cl. 250-265.000.
Jet-It-Done, Inc.: *See*—
Hamilton, Bert, Jr., 4,350,140, Cl. 126-276.000.
JGC Corporation: *See*—
Hashimoto, Noboru; and Akatsu, Mitsu, 4,350,665, Cl. 422-191.000.
Jimerson, Bruce D.; and Nakasone, Henry H. Electronic light switch. 4,350,903, Cl. 307-252.00B.
Jochum, Friedrich; Landsberg, Ernst; and Zschernack, Plano, to Walther & Cie Aktiengesellschaft. Rescue system on high rise buildings for evacuating persons in the case of fire. 4,350,224, Cl. 182-82.000.
Johansson, Anne S.; Hogman, Claes F.; and Hedlund, Kenneth G. Device for blood separation. 4,350,585, Cl. 210-94.000.
Johnson, Charles B.; and Abraham, Jimmy M., to International Telephone and Telegraph Corporation. Magnetically focused streak tube. 4,350,919, Cl. 313-99.000.
Johnson, Gary W.: *See*—
Hilson, David G.; Johnson, Gary W.; and Schoonejongen, Ronald J., 4,350,618, Cl. 252-514.000.
Johnson, Robert C., to Du Pont de Nemours, E. I., and Company. Method and apparatus for calorimetric differential thermal analysis. 4,350,446, Cl. 374-13.000.
Johnson, Ronald M., to Dev Tec Resources, Inc. Motor drive design. 4,350,430, Cl. 354-330.000.
Johnson, William S.; and Knepper, Ronald W., to International Business Machines Corp. Narrow channel length MOS field effect transistor with field protection region for reduced source-to-substrate capacitance. 4,350,991, Cl. 357-23.000.
Johnston, John W.: *See*—
Knutson, Richard K.; Webster, Bruce L.; Johnston, John W.; and Rispin, Peter P., 4,350,110, Cl. 114-243.000.
Jojima, Teruomi: *See*—
Fahmy, Mohamed A. H.; Fukuto, Tetsuo R.; and Jojima, Teruomi, 4,350,699, Cl. 424-263.000.
Jones, Carmen B., to United States of America, Air Force. Airfoil vibration test apparatus. 4,350,043, Cl. 73-579.000.
Jones, David N.; Burnett, Archibald L; and Miller, John C., to Union Carbide Corporation. Low-energy extruder-pump system. 4,350,657, Cl. 264-349.000.
Jones, Glenn C.: *See*—
McConnell, Richard L.; Trotter, Jimmy R.; and Jones, Glenn C., 4,350,807, Cl. 528-302.000.
McConnell, Richard L.; Trotter, Jimmy R.; and Jones, Glenn C., 4,350,808, Cl. 528-302.000.
Jones, Thaddeus M.: *See*—
Shah, Hasmukh R.; Jones, Thaddeus M.; and Hemingway, Bruce, 4,350,238, Cl. 194-1.00N.
Jones, Thomas B.; Morgan, Morris H.; and Dietz, Peter W., to General Electric Company. Magnetic field coupled spouted bed system. 4,349,967, Cl. 34-1.000.
Jorges, Shirley M.: *See*—
Hash, Juel T., 4,350,106, Cl. 112-410.000.
Josef Willmes GmbH: *See*—
Braun, Oskar, 4,350,089, Cl. 100-116.000.
Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Brunner, Josef, 4,349,941, Cl. 16-288.000.
Julke, Bernhard, to Engelbrecht & Lemmerbrock GmbH & Co. High-rise silos. 4,350,468, Cl. 414-325.000.
Julke, Elias: *See*—
Hartinger, Edmund; Julke, Elias; and Sandmann, Harald, 4,350,620, Cl. 252-628.000.
Junek, Hans; and Thierrichter, Burkhard, to Lonza Ltd. Process for the production of 4,6-diamino-5-cyano-3-aryl-isoxazolo [5,4-b] pyridines. 4,350,815, Cl. 546-115.000.
Junek, Hans; and Thierrichter, Burkhard, to Lonza Ltd. Process for the production of 4-amino-6-hydroxy-3-phenyl isoxazolo [5,4-b] pyridine-5-carbonitriles. 4,350,816, Cl. 546-116.000.
Jung, Johann: *See*—
Sauter, Hubert; Zeeh, Bernd; Buschmann, Ernst; and Jung, Johann, 4,350,518, Cl. 71-88.000.
Jung, Margarete; and Winsel, August, to Varta Batterie Aktiengesellschaft. Hydrophobic catalyst for recombiners. 4,350,610, Cl. 252-429.00R.
Jung, Rolf: *See*—
Croseck, Hans-Henning; and Jung, Rolf, 4,350,486, Cl. 425-412.000.
Jung, Siegfried: *See*—
Hoffmann, Bernd; Jung, Siegfried; and Semmler, Hans-Joachim, 4,350,206, Cl. 169-47.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Sato, Hirochika, 4,350,918, Cl. 310-367.000.
Toyokuni, Ryo, 4,350,961, Cl. 331-158.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Kondo, Nobuaki, 4,350,071, Cl. 84-1.030.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Taguchi, Kazumasa; Isako, Hiroshi; Ikeda, Koichi; Honda, Keisuke; Kanemoto, Masaru; and Hanaoka, Keishiro, 4,350,523, Cl. 75-0.50R.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Miyazaki, Kiyoshi; Takeuchi, Tsuneto; Ito, Jinichi; and Ashibe, Hiroo, 4,350,937, Cl. 318-331.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Aoki, Shigeru, 4,351,040, Cl. 368-88.000.
Shindo, Takemasa; Ito, Yoshikazu; and Arai, Kenichiro, 4,350,907, Cl. 310-37.000.
Kaco GmbH & Co.: *See*—
Heinrich, Richard, 4,350,347, Cl. 277-153.000.
Kadija, Igor V., to Olin Corporation. Current distributors for reticulate electrodes. 4,350,580, Cl. 204-279.000.
Kagari, Yoshiharu: *See*—
Suzuki, Shigeru; Suzuki, Minoru; Suzuki, Koichi; Omi, Kyoji; Nagahara, Yasumori; Kagari, Yoshiharu; Hashimoto, Makoto; and Mori, Goro, 4,350,750, Cl. 430-125.000.
Kahn, Marvin L.; and Eapen, Kuttikandathil E., to Rich Products Corporation. Methods of infusing fruits. 4,350,711, Cl. 426-102.000.
Kajitani, Makoto: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,350,700, Cl. 424-263.000.
Kalan, Gary L.; and Ipsen, Peter G., to General Electric Company. Air-sealed oil deflector. 4,350,345, Cl. 277-3.000.
Kalmykov, Anatoly M.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Tsipenjuk, Yakov I.; Goldshtein, Boris G.; Lavnikov, Nikolai S.; Teres, Leonid N.; Urazhdin, Ivan I.; Yakubovsky, Petr S.; Boiko, Vitaly T.; Kalmykov, Anatoly M.; Minyashkin, Dmitry P.; and Stepanov, Mikhail M., 4,350,213, Cl. 173-93.600.
Kamekawa, Kunio: *See*—
Kitano, Akihiro; and Kamekawa, Kunio, 4,350,124, Cl. 123-198.00R.
Kamioka, Nobuo, to Akebono Brake Industry Co., Ltd. Sintered alloy for friction materials. 4,350,530, Cl. 75-231.000.
Kamiya, Takashi; and Teraji, Tsutomu, to Fujisawa Pharmaceutical Co., Ltd. 3,7-Disubstituted-3-cephem-4-carboxylic acids. 4,350,692, Cl. 424-246.000.
Kanao, Shiro. Flexible hose. 4,350,547, Cl. 156-143.000.
Kanda, Mutsumi; Nakanishi, Kiyoshi; and Inoue, Tokuta, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel injection type internal combustion engine. 4,350,125, Cl. 123-261.000.
Kaneko, Makoto: *See*—
Suzuki, Hideo; and Kaneko, Makoto, 4,350,068, Cl. 84-1.010.
Kaneko, Shinichi: *See*—
Sutoh, Shinji; Harada, Takeshi; and Kaneko, Shinichi, 4,350,286, Cl. 236-44.00A.
Kaneko, Shunji, to Toyo Seikan Kaisha, Ltd. Easy-open can cap with a ring pull tab. 4,350,262, Cl. 220-273.000.
Kanemoto, Masaru: *See*—
Taguchi, Kazumasa; Isako, Hiroshi; Ikeda, Koichi; Honda, Keisuke; Kanemoto, Masaru; and Hanaoka, Keishiro, 4,350,523, Cl. 75-0.50R.
Kang, Kenneth S.; and Veeder, George T., to Merck & Co., Inc. *Klebsiella pneumoniae.* ATCC 31488. 4,350,769, Cl. 435-243.000.
Kao Soap Co., Ltd.: *See*—
Kurosaki, Tomihiro; and Manba, Akio, 4,350,645, Cl. 260-978.000.
Kaplienko, Igor P.: *See*—
Pokhodnya, Igor K.; Shlepakov, Valery N.; Alter, Vladimir F.; Ovcharenko, Nikolai T.; Kaplienko, Igor P.; and Rak, Petr I., 4,350,311, Cl. 242-83.000.
Kappler, Ulrich: *See*—
Kritzler, Helmuth; Bohm, Walter; Kappler, Ulrich; and Winkelmann, Hans D., 4,350,573, Cl. 203-86.000.
Kariya, Masatane; and Tomizawa, Akimori, to Clarion Company, Ltd. Data transmission system. 4,350,848, Cl. 179-2.0DP.
Karl, Horst: *See*—
Engelsmann, Dieter; Nicko, Reinhard; Bittner, Wilfried; and Karl, Horst, 4,350,423, Cl. 354-173.000.
Karube, Isao: *See*—
Suzuki, Shuichi; and Karube, Isao, 4,350,763, Cl. 435-29.000.
Kasahara, Masatoshi: *See*—
Sagae, Syoji; Matsuda, Yasumasa; Kasahara, Masatoshi; and Suzuki, Masayoshi, 4,350,989, Cl. 346-140.00R.
Kastner, Gerhard; Siegel, Hardo; and Geiss, Karl-Heinz, to BASF Aktiengesellschaft. Preparation of phenylacetonitriles carrying basic substituents. 4,350,636, Cl. 549-435.000.
Kasui, Toshikatsu: *See*—
Takahashi, Yosuke; Akasaka, Hideki; Kasui, Toshikatsu; and Niwa, Tatsuo, 4,350,414, Cl. 350-357.000.
Katakura, Hiroshi; and Nagoshi, Mitsuru, to Konishiroku Photo Industry Co., Ltd. Sheet feeding apparatus. 4,350,328, Cl. 271-22.000.
Katayama, Hideo: *See*—
Fujii, Hiroo; Tanaka, Kiyoaki; Nakamura, Masashi; Okuno, Ryuzo; Hashizume, Shigeyuki; Katayama, Hideo; and Fujita, Tsutomu, 4,350,326, Cl. 266-201.000.
Katayama, Yasunori: *See*—
Sakata, Kazuhiro; Yuminaka, Takeo; Nakazato, Masao; Yoneda, Kenji; Kuzunuki, Soshiro; and Katayama, Yasunori, 4,350,225, Cl. 187-29.00R.

Kato, Akira: *See*—
Matsuda, Shimpei; Kato, Akira; Mori, Toshikatsu; Kumagai, Teruo; Hishinuma, Yukio; Akimoto, Hidetoshi; and Nakajima, Fumito, 4,350,670, Cl. 423-244.000.

Kato, Jyoji: *See*—
Chibata, Ichiro; Kato, Jyoji; and Wada, Mitsuru, 4,350,765, Cl. 435-161.000.

Kato, Matsuo; Ohtsuki, Tomonari; Igarashi, Yoshiaki; Saito, Tsukasa; and Suzuki, Toshiaki, to Bunker Ramo Corporation. Connector keying device. 4,350,409, Cl. 339-186.00M.

Kato, Shogo: *See*—
Kitai, Kiyoshi; Morino, Yukio; Kato, Shogo; and Watanabe, Masanori, 4,350,427, Cl. 354-238.000.

Kato, Toshio: *See*—
Nagai, Shosuke; Kato, Toshio; Iguchi, Chojiro H.; Kawashima, Nobuyuki; Mita, Ryuichi; Yamaguchi, Akihiro; and Takano, Takao, 4,350,643, Cl. 260-465.700.

Katoogi, Masayuki, to Moriyama Sangyo Kabushiki Kaisha. Fluorescent lighting device. 4,350,929, Cl. 315-49.000.

Kawai, Hisasi: *See*—
Yoshinaga, Toru; Igashira, Toshihiko; Mori, Kouichi; Kawai, Hisasi; and Morino, Seiji, 4,350,137, Cl. 123-617.000.

Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,350,072, Cl. 84-1.240.

Kawai, Syuji; Yamane, Tadayuki; Abe, Michio; Ono, Toshihiko; and Yamauchi, Shuji, to Kuraray Co., Ltd.; and Kawasumi Laboratories, Inc. Blood purification using plural ultrafiltration stages. 4,350,594, Cl. 210-637.000.

Kawakami, Nobuyoshi: *See*—
Hamada, Isao; Nakayama, Hiroshi; Kawakami, Nobuyoshi; Azami, Hirotaka; Ikeda, Tadasu; Yukawa, Yasumasa; Mitani, Hiroshi; Ohmori, Takashi; Kimura, Masanobu; and Seno, Kohichi, 4,350,510, Cl. 55-349.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujii, Hiroo; Tanaka, Kiyoaki; Nakamura, Masashi; Okuno, Ryuzo; Hashizume, Shigeyuki; Katayama, Hideo; and Fujita, Tsutomu, 4,350,326, Cl. 266-201.000.

Kawasaki Steel Corporation: *See*—
Fujii, Hiroo; Tanaka, Kiyoaki; Nakamura, Masashi; Okuno, Ryuzo; Hashizume, Shigeyuki; Katayama, Hideo; and Fujita, Tsutomu, 4,350,326, Cl. 266-201.000.
Tsujimoto, Eiichi; Hirahara, Hiroshi; and Matsumoto, Makoto, 4,350,004, Cl. 53-570.000.

Kawasaki, Teruo: *See*—
Kogawa, Kouichi; Kawasaki, Teruo; and Nomura, Hiroyuki, 4,350,901, Cl. 307-10.00R.

Kawashima, Nobuyuki: *See*—
Nagai, Shosuke; Kato, Toshio; Iguchi, Chojiro H.; Kawashima, Nobuyuki; Mita, Ryuichi; Yamaguchi, Akihiro; and Takano, Takao, 4,350,643, Cl. 260-465.700.

Kawasumi Laboratories, Inc.: *See*—
Kawai, Syuji; Yamane, Tadayuki; Abe, Michio; Ono, Toshihiko; and Yamauchi, Shuji, 4,350,594, Cl. 210-637.000.

Kawata, Shoji; Hattori, Kyo; and Sakurai, Kazuhiro, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Control for an electromagnetic solenoid valve. 4,350,319, Cl. 251-65.000.

Kawauchi, Noboru: *See*—
Kuwabara, Eiji; Sakata, Takayoshi; Kawauchi, Noboru; Ide, Yuuichi; and Matsuo, Takeshi, 4,350,023, Cl. 62-176.00E.

Kay, David B.; and Wheeless, Leon L., Jr., to Research Corporation. X'-, Y'-, Z'- axis multidimensional slit-scan flow system. 4,350,892, Cl. 250-461.200.

Kayano, Masanori: *See*—
Mizuno, Yasuhiko; and Kayano, Masanori, 4,350,679, Cl. 424-38.000.

Kearton, Gloria M.; and Kearton, Malcolm C. Women's brassiers and other similar dress. 4,350,162, Cl. 128-477.000.

Kearton, Malcolm C.: *See*—
Kearton, Gloria M.; and Kearton, Malcolm C., 4,350,162, Cl. 128-477.000.

Keen, Ralph O., to Taper Line, Inc. Method of locking a male member to a female member. 4,349,955, Cl. 29-526.00R.

Keith, Alec D.; and Snipes, Wallace, to Research Corporation. Inactivation of lipid containing viruses with butylated hydroxytoluene. 4,350,707, Cl. 424-346.000.

Keller, Karl-Heinz: *See*—
Albrecht, Ernst; Hensel, Reiner; Keller, Karl-Heinz; and Stahlschmitt, Horst, 4,350,105, Cl. 112-256.000.

Kelley, William J.: *See*—
Kilroy, Eugene J.; Kelley, William J.; and Crain, Philip W., 4,349,983, Cl. 46-12.000.

Kember, Peter N.: *See*—
Robinson, Grenville A.; Kember, Peter N.; and Burns, Derek K., 4,350,660, Cl. 422-90.000.

Kemmel, Alexander. Arrangement for holding cigarettes. 4,350,171, Cl. 131-234.000.

Kemp, David M.: *See*—
Skoli, Sigmund P.; Kemp, David M.; and Mojonnier, Harry G., 4,350,503, Cl. 55-165.000.

Kendall, Elizabeth Virginia: *See*—
Kendall, Robert W., 4,350,052, Cl. 73-863.860.

Kendall, Robert W., to Kendall, Elizabeth Virginia. Apparatus and method for tapping and extracting oil samples from an underground high pressure pipe-type transmission cable system. 4,350,052, Cl. 73-863.860.

Kennametal Inc.: *See*—
Friedline, Ernest J., 4,350,463, Cl. 409-234.000.

Kennecott Corporation: *See*—
Knoepke, John R.; and George, David B., 4,350,524, Cl. 75-63.000.

Kennedy, Alvin B., Jr. Method and apparatus for recovering waste oil. 4,350,596, Cl. 210-708.000.

Kepner, Nancy: *See*—
Lipton, Allan; and Kepner, Nancy, 4,350,687, Cl. 424-177.000.

Kerber, Helmut: *See*—
Rosemeier, Friedrich; and Kerber, Helmut, 4,350,284, Cl. 233-27.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Zimmermann, Ulrich; Saleemuddin, Mohammed; and Pilwat, Gunter, 4,350,767, Cl. 435-183.000.

Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung: *See*—
Vollath, Dieter, 4,350,884, Cl. 250-204.000.

Kerwin, Kenneth H., II: *See*—
Helgeland, Walter; Teverovsky, Alex; Kerwin, Kenneth H., II; and Chartier, Carl P., 4,350,560, Cl. 156-617.0SP.

Kesling, Peter C.; and Henderlong, Dennis B., to TP Laboratories, Inc. Lock pin. 4,350,487, Cl. 433-14.000.

Kessler, Stephen B., to Becton, Dickinson and Company. Assembly, compositions and method for separating blood. 4,350,593, Cl. 210-516.000.

Keuffel & Esser Company: *See*—
Popoff, Andrew, 4,350,555, Cl. 156-540.000.

Khutoretsky, Garry M.; Tjurin, Jury G.; Drozdova, Larisa A.; and Belova, Tamara N. Electrical machine stator. 4,350,910, Cl. 310-64.000.

Kiefer, Joseph H., to United States of America, Energy. Method of automatically welding with a non-consumable electrode. 4,350,869, Cl. 219-137.00R.

Kightlinger, Drew A.: *See*—
Dials, Edward N.; and Kightlinger, Drew A., 4,350,452, Cl. 400-208.000.

Kiikka, Oliver A.; and Day, Donald R., to Standard Oil Company. Carbon electrodes having a low coefficient of thermal expansion. 4,351,056, Cl. 373-88.000.

Kikuta, Masaaki, to Nissan Motor Co., Ltd. Instrument board mounting structure. 4,350,383, Cl. 296-72.000.

Kilo-Wattch-Dog, Inc.: *See*—
Knauer, Joseph; and Moskowitz, Howard, 4,350,337, Cl. 273-43.00A.

Kilroy, Eugene J.; Kelley, William J.; and Crain, Philip W., to Mattel, Inc. Playset for toy vehicles. 4,349,983, Cl. 46-12.000.

Kim, Dong H.; and McCaully, Ronald J., to American Home Products Corporation. N-(2-Substituted-1-oxoalkyl)-2,3-dihydro-1H-indole-2-carboxylic acid derivatives. 4,350,633, Cl. 260-326.11R.

Kimball International, Inc.: *See*—
Howell, Stephen L., 4,350,069, Cl. 84-1.030.

Kimpel, Gunter, to Staedtler, J. S. Thermoplastic eraser. 4,350,787, Cl. 524-302.000.

Kimura, Akiteru: *See*—
Osada, Hajime; Kimura, Akiteru; Shimizu, Tokuo; Kitajima, Goro; Tomizawa, Yoshio; Kondo, Makoto; Motoyama, Kazuyasu; and Daigaku, Masaaki, 4,351,009, Cl. 360-105.000.

Kimura, Kunio: *See*—
Nishino, Atsushi; Kimura, Kunio; Sonetaka, Kazunori; and Takeuchi, Yasuhiro, 4,350,613, Cl. 252-455.00R.

Kimura, Masanobu: *See*—
Hamada, Isao; Nakayama, Hiroshi; Kawakami, Nobuyoshi; Azami, Hirotaka; Ikeda, Tadasu; Yukawa, Yasumasa; Mitani, Hiroshi; Ohmori, Takashi; Kimura, Masanobu; and Seno, Kohichi, 4,350,510, Cl. 55-349.000.

Kincaid, John F.; and Reed, Russell, Jr., to United States of America, Navy. Bonding agent for HMX (cyclotetramethylenetetranitramine). 4,350,542, Cl. 149-11.000.

King, Dennis M., to Caterpillar Tractor Co. Torque spring adjustment mechanism. 4,350,127, Cl. 123-364.000.

King, James F.: *See*—
Field, Thomas R.; Jagodzinski, Peter F.; King, James F.; and Schaefer, John O., 4,350,453, Cl. 400-208.000.

King Reel Proprietary Limited: *See*—
Brodribb, Marcus T.; and Brodribb, Antony G., 4,349,977, Cl. 43-15.000.

Kinoshita, Kyoichi; and Kobayashi, Morio, to Nippon Telegraph & Telephone Public Corporation. Fusion splicing of multi-layer optical fiber bundles. 4,350,867, Cl. 219-121.0LC.

Kiritani, Takeshi: *See*—
Ishijima, Shizuo; Kiritani, Takeshi; and Hayashi, Yukio, 4,350,535, Cl. 106-308.00Q.

Kirk, Richard L.: *See*—
Crossman, Richard L.; and Kirk, Richard L., 4,350,231, Cl. 188-218.0XL.

Kishi, Norimasa; and Suzuki, Tadashi, to Nissan Motor Co., Ltd. Shift control system for a vehicle automatic transmission. 4,350,057, Cl. 74-866.000.

Kitai, Kiyoshi; Morino, Yukio; Kato, Shogo; and Watanabe, Masanori, to Seiko Koki Kabushiki Kaisha. Electromagnetic shutter release device for cameras. 4,350,427, Cl. 354-238.000.

Kitajima, Goro: *See*—
Osada, Hajime; Kimura, Akiteru; Shimizu, Tokuo; Kitajima, Goro; Tomizawa, Yoshio; Kondo, Makoto; Motoyama, Kazuyasu; and Daigaku, Masaaki, 4,351,009, Cl. 360-105.000.

Kitajima, Satoyuki: *See*—
Imai, Ichiro; Furuya, Takashi; Ando, Narumi; and Kitajima, Satoyuki, 4,350,538, Cl. 148-12.00D.
Kitamura, Shigeki: *See*—
Akiyama, Masatoshi; Kitamura, Shigeki; Tetsu, Junichi; and Nakazato, Koichi, 4,350,514, Cl. 65-36.000.
Kitamura, Shinichi: *See*—
Hamano, Sachiyuki; Kitamura, Shinichi; Igarashi, Toshiji; and Nakajima, Yoshikage, 4,350,705, Cl. 424-278.000.
Kitano, Akihiro; and Kamekawa, Kunio, to Yamaha Hatsudoki Kabushiki Kaisha. Overflow device for vehicular carburetor. 4,350,124, Cl. 123-198.00R.
Kitano, Shigeru: *See*—
Mochizuki, Daisuke; and Kitano, Shigeru, 4,351,008, Cl. 360-40.000.
Kiuchi, Hideo; and Kobayashi, Nobuyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel injection device of an internal combustion engine. 4,350,131, Cl. 123-453.000.
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Cyclohexyl phenethylether and uses thereof in combatting tobacco beetles and in augmenting or enhancing the aroma of perfumes, colognes and perfumed articles. 4,350,733, Cl. 428-290.000.
Kiyohara, Takehiko: *See*—
Imai, Nobuhiro; Kono, Kimio; Hoshito, Kazuo; Kiyohara, Takehiko; and Sato, Hideaki, 4,351,005, Cl. 358-300.000.
Kladders, Heinrich: *See*—
Gupte, Arun R.; Kladders, Heinrich; and Struth, Helmut, 4,350,049, Cl. 73-864.510.
Klag, Gunther: *See*—
Blank, Heinz U.; Klag, Gunther; and Schnegg, Peter, 4,350,566, Cl. 162-72.000.
Klar, Erhard: *See*—
Ro, David H.; Klar, Erhard; and Whitman, Charles I., 4,350,529, Cl. 75-228.000.
Kleiber & Schulz, Inc.: *See*—
Schulz, Adalbert; and Borchert, Werner, 4,350,202, Cl. 165-95.000.
Klein, Erwin, to BBC Brown, Boveri & Company, Limited. Cooling device for electrical and/or electronic component elements producing lost heat and a procedure for operating such. 4,350,026, Cl. 62-333.000.
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., to International Flavors & Fragrances Inc. Carbomethoxy methyl norbornanes. 4,350,823, Cl. 560-120.000.
Klessig, Clarence E.: *See*—
Fleischmann, Gary A.; and Klessig, Clarence E., 4,349,940, Cl. 16-110.00R.
Kline, Larry Harold: *See*—
Brown, William L., 4,350,194, Cl. 150-1.50C.
Kloss, Gerhard: *See*—
Molter, Michael; and Kloss, Gerhard, 4,350,674, Cl. 424-1.000.
Klutts, James H. Apparatus for dispensing a chemical into a fluid. 4,350,666, Cl. 422-263.000.
Knapp, Milton E.: *See*—
Kristapovich, Paul J.; and Knapp, Milton E., 4,350,022, Cl. 62-174.000.
Knauer, Joseph; and Moskowitz, Howard, to Kilo-Wattch-Dog, Inc. Energy saving arrangement for bowling apparatus. 4,350,337, Cl. 273-43.00A.
Knauer, Karl, to Siemens Aktiengesellschaft. Input stage for a monolithically integrated charge transfer device which generates two complementary charge packets. 4,350,902, Cl. 307-221.00D.
Kneip, George D.; Broshear, John H.; and Anderson, Marvin H., to Varian Associates, Inc. Cryostat structure. 4,350,017, Cl. 62-50.000.
Knepper, Ronald W.: *See*—
Johnson, William S.; and Knepper, Ronald W., 4,350,991, Cl. 357-23.000.
Knestele, Leopold. Rug and carpet cleaning apparatus. 4,349,935, Cl. 15-320.000.
Knight, Clifford, to Xerox Corporation. Sheet handling apparatus. 4,350,332, Cl. 271-188.000.
Knight, Lindsay C.; Phillips, Robert B.; Bowyer, William H.; and Moxley, Bruce, to Australasian Training Aids, Pty., Ltd. Projectile position detection apparatus. 4,350,881, Cl. 235-400.000.
Knoche, Raymond E., to Bohn & Dawson. Wheelchair brake assembly. 4,350,227, Cl. 188-2.00F.
Knoepke, John R.; and George, David B., to Kennecott Corporation. Process for removal of base metal impurities from molten silver with sulfur hexafluoride. 4,350,524, Cl. 75-63.000.
Knowlton, Floyd M. Interim preservation of surface coating applicators. 4,350,658, Cl. 422-40.000.
Knutson, Richard K.; Webster, Bruce L.; Johnston, John W.; and Rispin, Peter P., to United States of America, Navy. Integrated faired towline with integral locking feature. 4,350,110, Cl. 114-243.000.
Kobayashi, Koichi: *See*—
Shimokawa, Wataru; Ito, Yoshiaki; Kobayashi, Koichi; Fukumori, Katuaki; and Iwase, Nobukazu, 4,350,788, Cl. 524-309.000.
Kobayashi, Morio: *See*—
Kinoshita, Kyoichi; and Kobayashi, Morio, 4,350,867, Cl. 219-121.0LC.
Kobayashi, Nobuyuki: *See*—
Kiuchi, Hideo; and Kobayashi, Nobuyuki, 4,350,131, Cl. 123-453.000.
Koch Process Systems, Inc.: *See*—
Holmes, Arthur S.; and Ryan, James M., 4,350,511, Cl. 62-17.000.
Kochackis, Donald G. Vending machine lock security cover. 4,350,032, Cl. 70-427.000.
Kocharian, Alfred; and Spector, George. Frozen beverage stick including retractable cup. 4,350,712, Cl. 426-134.000.
Kock, Klaus: *See*—
Schmoldt, Harm; Kock, Klaus; and Strathmann, Heinrich, 4,350,581, Cl. 204-301.000.
Kockums Industri AB: *See*—
Adolfsson, Bertil, 4,350,188, Cl. 144-2.00Z.
Kodaka, Tatsuya. Steam pressure-propelled toy. 4,349,985, Cl. 46-95.000.
Koehler, Robert L. Adjustable wrench. 4,350,063, Cl. 81-64.000.
Koenig, Fredrick, to General Electric Company. Methods and apparatus for feeding and handling electrical phase insulators for dynamoelectric machines. 4,349,956, Cl. 29-596.000.
Kogawa, Kouichi; Kawasaki, Teruo; and Nomura, Hiroyuki, to Nissan Motor Company, Limited. Control circuit for electronic meter in an automotive vehicle. 4,350,901, Cl. 307-10.00R.
Kohlensaure-Werke Rud. Buse GmbH & Co.: *See*—
Frank, Karl; and Marnette, Ewald, 4,350,018, Cl. 62-54.000.
Kohler Co.: *See*—
Fleischmann, Gary A.; and Klessig, Clarence E., 4,349,940, Cl. 16-110.00R.
Koitabashi, Takeo; Matsuzaka, Syozi; Iijima, Toshifumi; and Harada, Tetsuya, to Konishiroku Photo Industry Co., Ltd. Photographic emulsion containing copper halide host crystals. 4,350,758, Cl. 430-567.000.
Kojima, Kunio: *See*—
Hasegawa, Yo; Yasuda, Shigeru; and Kojima, Kunio, 4,350,741, Cl. 428-473.500.
Kolarik, Oldrich S., to Mack Trucks, Inc. Piston ring and groove assemblies. 4,350,352, Cl. 277-216.000.
Kolb, Eugen; and Srock, Rainer, to Ing. h.c.F. Porsche Aktiengesellschaft. Roll bar for vehicles, especially motor vehicles. 4,350,367, Cl. 280-756.000.
Kolesov, Evgeny V.; Smirnov, Boris A.; Fedotov, Vladimir M.; and Lipovsky, Iosif L. Instrument for establishing vascular anastomoses. 4,350,160, Cl. 128-334.00R.
Kollmann, Bernd: *See*—
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,349,948, Cl. 29-157.10R.
Komatsu Zenoah Co.: *See*—
Itagaki, Hidehiko; and Suzuki, Yuji, 4,349,962, Cl. 30-276.000.
Kondo, Makoto: *See*—
Osada, Hajime; Kimura, Akiteru; Shimizu, Tokuo; Kitajima, Goro; Tomizawa, Yoshio; Kondo, Makoto; Motoyama, Kazuyasu; and Daigaku, Masaaki, 4,351,009, Cl. 360-105.000.
Kondo, Nobuaki, to Kabushiki Kaisha Kawai Gakki Seisakusho. Automatic accompaniment circuit. 4,350,071, Cl. 84-1.030.
Kondo, Teruhisa: *See*—
Watanabe, Nobuatsu; Kondo, Teruhisa; and Ishiguro, Jiro, 4,350,576, Cl. 204-101.000.
Kondoh, Shiroh, to Ricoh Company Ltd. Development apparatus for developing latent electrostatic images. 4,350,432, Cl. 355-3.0DD.
Koneke, Johannes: *See*—
Schulz, Horst-Hermann; and Koneke, Johannes, 4,350,398, Cl. 308-216.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Ishiyama, Shozo, 4,350,416, Cl. 350-427.000.
Katakura, Hiroshi; and Nagoshi, Mitsuru, 4,350,328, Cl. 271-22.000.
Koitabashi, Takeo; Matsuzaka, Syozi; Iijima, Toshifumi; and Harada, Tetsuya, 4,350,758, Cl. 430-567.000.
Kono, Kimio: *See*—
Imai, Nobuhiro; Kono, Kimio; Hoshito, Kazuo; Kiyohara, Takehiko; and Sato, Hideaki, 4,351,005, Cl. 358-300.000.
Kopp, Reiner; and Hornauer, Klaus-Peter. Method of shaping objects by means of a solid-particle blast applied to one side thereof. 4,350,035, Cl. 72-53.000.
Kortech Engineering, Inc.: *See*—
Allen, Ralph A.; and Zylkowski, John T., 4,350,401, Cl. 339-65.000.
Kossek, Gunter; and Emmerich, Heinz, to Solo Kleinmotoren GmbH. Hand-held power tool with a combustion motor. 4,350,123, Cl. 123-2.000.
Kotobuki Seihan Printing Co., Ltd.: *See*—
Saitoh, Joichi, 4,350,735, Cl. 428-328.000.
Kotula, Frank T.; and Hilgemann, Marvin E. Herbicide dispensing apparatus. 4,349,988, Cl. 47-1.500.
Kovacik, James D.: *See*—
Kovacik, James W.; Kovacik, James D.; Blanch, Thomas J.; and Blanch, Paul S., 4,350,850, Cl. 191-12.20R.
Kovacik, James W.; Kovacik, James D.; Blanch, Thomas J.; and Blanch, Paul S., to Alert Stamping & Manufacturing Company, Inc. Self-switching electric cord reel. 4,350,850, Cl. 191-12.20R.
Kovacs, Sandor, to Vasipari Kutato Intezet. Measuring journal for the conversion of force to electric signal. 4,350,048, Cl. 73-862.540.
Koyata, Kenji: *See*—
Kubota, Tetsumaru; and Koyata, Kenji, 4,350,150, Cl. 128-6.000.
Kramer, Petrus J. A., to Estel Hoogovens B.V. Method of removal of slag deposits from the bottom of a furnace. 4,350,324, Cl. 266-44.000.
Kranz, Joachim: *See*—
Fechner, Wolf D.; Kranz, Joachim; and Polster, Rudolf, 4,350,534, Cl. 106-288.00Q.
Kreder, Hans; and Weislogel, Horst. Arrangement for aligning a material web, particularly a veneer web. 4,350,276, Cl. 226-16.000.

Kreeley, Bruce K., to Singer Company, The. Valve coupling member. 4,350,181, Cl. 137-614.000.

Kristapovich, Paul J.; and Knapp, Milton E., to Crepaco, Inc. Refrigerant transfer system. 4,350,022, Cl. 62-174.000.

Kritzer, Richard W. Method of making heat exchangers. 4,349,949, Cl. 29-157.30A.

Kritzler, Helmuth; Bohm, Walter; Kappler, Ulrich; and Winkelmann, Hans D., to Bayer Aktiengesellschaft. Halogenated aromatic amines which are stable in color, and a process for their preparation. 4,350,573, Cl. 203-86.000.

Kronsbein, Dirk G. Cartridge filter. 4,350,592, Cl. 210-450.000.

Krull, Irwin H.: *See*—
Schwartz, Henry D.; Krull, Irwin H.; Clement, Carl J.; Stengel, Frederick H.; and Hayslett, David D., 4,350,579, Cl. 204-195.00R.

Krumwiede, John F., to PPG Industries, Inc. Glass melting method using cullet as heat recovery and particulate collection medium. 4,350,512, Cl. 65-27.000.

Krupp Polysius AG: *See*—
Heinemann, Otto; Schmits, Heinz-Herbert; Philipp, Rainer; and Berger, Artur, 4,350,244, Cl. 198-773.000.

Kruse, Stanley K. Smoke exhaust apparatus for a rotary welder. 4,350,280, Cl. 228-29.000.

Krylova, Vera E.: *See*—
Alexandrov, Vyacheslav S.; Guschin, Alexandr E.; Zavodov, Rudolf V.; Zbukova, Elena I.; Ivanov, Alexandr A.; Fofanova, Tatyana S.; Mikhailov, Evgeny I.; Dianov, Ivan M.; Luzin, Pavel M.; Sergeev, Igor A.; Pankratova, Lidia A.; Krylova, Vera E.; and Leibenzon, Semen A., 4,350,482, Cl. 425-83.100.

Kubota, Tetsumaru; and Koyata, Kenji, to Olympus Optical Co., Ltd. Structure of a light-receiving end portion of an endoscope light guide. 4,350,150, Cl. 128-6.000.

Kubota, Yutaka; and Sugimoto, Hitoshi, to Diesel Kiki Kabushiki Kaisha. Control circuit for a glow plug assembly serving as an engine preheating means. 4,350,876, Cl. 219-497.000.

Kuchler, Manfred; Duve, Gunther; and Ebigt, Joachim, to Hoechst Aktiengesellschaft. Aqueous plastic dispersion, a process for its preparation, its use and a sheet prepared from the plastic dispersion. 4,350,782, Cl. 523-334.000.

Kuehler, Christopher W.: *See*—
Rosenthal, Joel W.; Dahlberg, Arthur J.; and Kuehler, Christopher W., 4,350,582, Cl. 208-8.0LE.

Kuhlman, Ora F.; and Tobey, Samuel, to Technical Irrigation Products, Inc. Access sleeve for drip irrigation emitters. 4,350,296, Cl. 239-201.000.

Kuhn, William T., to Kuhn, William T.; Rose, Paul F.; and Rose, Thomas H., a part interest. Method and apparatus for controlling the speed of a traveling web. 4,350,275, Cl. 226-14.000.

Kuhnle, Ernst; and Schwarz, Josef, to Bizerba-Werke Wilhelm Kraut KG. Balance arm for flat weighing machines. 4,350,217, Cl. 177-246.000.

Kulhanek, Antonin: *See*—
Porta, Augusto; Fresnel, Jean-Marie; and Kulhanek, Antonin, 4,350,575, Cl. 204-84.000.

Kulieke, Fred C., Jr.: *See*—
Hanula, Richard M.; and Kulieke, Fred C., Jr., 4,350,256, Cl. 213-69.000.

Kumagai, Teruo: *See*—
Matsuda, Shimpei; Kato, Akira; Mori, Toshikatsu; Kumagai, Teruo; Hishinuma, Yukio; Akimoto, Hidetoshi; and Nakajima, Fumito, 4,350,670, Cl. 423-244.000.

Kumana, Cyrus R., to Cressington Investments Ltd. Steroid composition. 4,350,690, Cl. 424-243.000.

Kummer, Rudolf; Taglieber, Volker; Weis, Franz-Josef; and Schneider, Heinz-Walter, to BASF Aktiengesellschaft. Purification of carboxylic acid esters containing aldehydes and/or acetals. 4,350,572, Cl. 203-35.000.

Kuntz, J. David. Intervertebral disc prosthesis. 4,349,921, Cl. 3-1.000.

Kupper, Wolfgang: *See*—
Vester, Ewald; Grussaber, Rolf; Kupper, Wolfgang; and Glatzhofer, Horst, 4,349,964, Cl. 33-264.000.

Kuraray Co., Ltd.: *See*—
Kawai, Syuji; Yamane, Tadayuki; Abe, Michio; Ono, Toshihiko; and Yamauchi, Shuji, 4,350,594, Cl. 210-637.000.

Kurosaki, Tomihiro; and Manba, Akio, to Kao Soap Co., Ltd. Method for producing a phosphoric monoester. 4,350,645, Cl. 260-978.000.

Kusakabe Denki Kabushiki Kaisha: *See*—
Hayashi, Shigeki; and Kusakabe, Mitsuo, 4,350,065, Cl. 83-287.000.

Kusakabe, Mitsuo: *See*—
Hayashi, Shigeki; and Kusakabe, Mitsuo, 4,350,065, Cl. 83-287.000.

Kuwabara, Eiji; Sakata, Takayoshi; Kawauchi, Noboru; Ide, Yuuichi; and Matsuo, Takeshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Air conditioning apparatus. 4,350,023, Cl. 62-176.00E.

Kuwabara, Kouji: *See*—
Sasaki, Kouji; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Takemori, Satoshi; and Ikemoto, Norio, 4,351,052, Cl. 372-58.000.

Kuwayama, Takeshi: *See*—
Seto, Susumu; Tokuhara, Mitsuhiro; Takemura, Yukio; Yamada, Yu; and Kuwayama, Takeshi, 4,350,433, Cl. 355-8.000.

Kuzunuki, Soshiro: *See*—
Sakata, Kazuhiro; Yuminaka, Takeo; Nakazato, Masao; Yoneda, Kenji; Kuzunuki, Soshiro; and Katayama, Yasunori, 4,350,225, Cl. 187-29.00R.

Kwasniak, Wesley. Raft knife. 4,349,960, Cl. 30-153.000.

LaBate, Micheal D. Prefabricated multiple density blast furnace runner. 4,350,325, Cl. 266-196.000.

Lace, Donald A. Check valve structure. 4,350,176, Cl. 137-242.000.

Lacrex Brevetti S.A.: *See*—
Pasbrig, Max, 4,350,335, Cl. 272-67.000.

Lacroix, Serge: *See*—
Chable, Yves A.; Lacroix, Serge; and Rault, Philippe M., 4,350,168, Cl. 128-736.000.

Laeis-Werke AG: *See*—
Croseck, Hans-Henning; and Jung, Rolf, 4,350,486, Cl. 425-412.000.

Lagarde, Pierre, to Imphy S.A. Method of marking and of identifying objects marked by electrically conducting elements. 4,350,883, Cl. 235-435.000.

Laine, Loic Y.: *See*—
Cannavo, Christian G.; Cousin, Georges; Espagnacq, Andre; Frayssac, Jacques X.; Laine, Loic Y.; Midrouillet, Daniel J.; Pintenat, Andre M.; and Reboux, Jean B., 4,350,096, Cl. 102-209.000.

Laing, Ingeborg: *See*—
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,350,143, Cl. 126-415.000.

Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver. Solar power station having groups of solar collectors. 4,350,143, Cl. 126-415.000.

Laing, Oliver: *See*—
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,350,143, Cl. 126-415.000.

Lama, William L.: *See*—
Avery, Stephen T.; Durbin, John A.; Lama, William L.; and Steibitz, Paul H., 4,351,019, Cl. 362-298.000.

Landa, Benzion, to Savin Corporation. Large-capacity sheet-stacking apparatus. 4,350,333, Cl. 271-217.000.

Landa, Benzion, to Savin Corporation. Synchronizing system for rapid-fire gun in a microballistic printer or the like. 4,350,447, Cl. 400-118.000.

Landaeus, Kjell G., to Lund Hydromaskin AB. Ram block. 4,350,214, Cl. 173-126.000.

Landauer, Franz: *See*—
Hesse, Wolfgang; Landauer, Franz; and Schmiedel, Klaus, 4,350,800, Cl. 525-480.000.

Landers, Donald F., to PSI Mobile Products, Inc. Self-centering trailer hitch. 4,350,362, Cl. 280-478.00A.

Landis, John M.: *See*—
Douty, George H.; Landis, John M.; and Ritchie, Leon T., 4,350,402, Cl. 339-74.00R.

Landsberg, Ernst: *See*—
Jochum, Friedrich; Landsberg, Ernst; and Zschernack, Plano, 4,350,224, Cl. 182-82.000.

Lane, Sandra M.: *See*—
Geelhood, Bruce D.; Mastny, Gary F.; Solomon, Jerry E.; Wesley, Edward J.; Lindner, Elek; Dooley, Carol A.; and Lane, Sandra M., 4,350,890, Cl. 250-372.000.

Lang, Siegfried: *See*—
Straub, Ferdinand; Lang, Siegfried; and Roske, Eckhard, 4,350,791, Cl. 525-123.000.

Lange International S.A.: *See*—
Everest, David C., III, 4,349,971, Cl. 36-121.000.

Langenberg, Werner: *See*—
Heberling, Walter; Muller, Wolfgang; Langenberg, Werner; Behrens, Gerhard; and Saul, Alfred, 4,350,393, Cl. 299-50.000.

Lantier, Frederic: *See*—
Pardon, Pierre; Lantier, Frederic; Marly, Jose; and Bourgy, Gerard, 4,350,684, Cl. 424-92.000.

Lar Machinerie Inc.: *See*—
Duchesne, Ghislain, 4,350,189, Cl. 144-2.00Z.

Larribe, Andre, to Societe Nationale Industrielle Aerospatiale. Device for moulding cylindrical pieces. 4,350,485, Cl. 425-389.000.

Lass, John L., to Square D Company. Cable lock for electrical outlet box. 4,350,839, Cl. 174-65.00G.

Laties, Alan M.; and Stone, Richard A. Ophthalmic use of carboxyfluorescein. 4,350,676, Cl. 424-7.000.

Lautensleger, Richard W.; Shepard, Richard D.; and Seaburg, Paul A., to Armco Inc. Integrated roof system. 4,349,996, Cl. 52-655.000.

Lavnikov, Nikolai S.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Tsipenjuk, Yakov I.; Goldshtein, Boris G.; Lavnikov, Nikolai S.; Teres, Leonid N.; Urazhdin, Ivan I.; Yakubovsky, Petr S.; Boiko, Vitaly T.; Kalmykov, Anatoly M.; Minyashkin, Dmitry P.; and Stepanov, Mikhail M., 4,350,213, Cl. 173-93.600.

Layden, George K., Jr.; Bourdeau, Romeo G.; and Pike, Roscoe A., to United Technologies Corporation. Binderless carbon or graphite articles. 4,350,672, Cl. 423-445.000.

Layne, Richard C. Bumper seal. 4,349,992, Cl. 52-173.0DS.

Lazzari, Jean-Pierre, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Structure for multilayer circuits. 4,350,743, Cl. 428-622.000.

Lee, Joseph E. Drilling mud cleaning apparatus. 4,350,591, Cl. 210-384.000.

Lee, Kuo-Hsiung, to Research Corporation. Bruceolides. 4,350,638, Cl. 549-275.000.

Lees, David H.: *See*—
Dyson, David V.; Lees, David H.; Fenn, Michael A. F.; and Darley, Kenneth S., 4,350,713, Cl. 426-243.000.

Lehmann, J. C. Ludwig, to Binz GmbH & Co. Roof rack in particular for cross country vehicles, ambulances and the like. 4,350,471, Cl. 414-463.000.

Lehtinen, John G. Sectional wheel with relatively rotatable sections. 4,350,394, Cl. 301-38.00R.
Leibenzon, Semen A.: *See*—
Alexandrov, Vyacheslav S.; Guschin, Alexandr E.; Zavodov, Rudolf V.; Zhukova, Elena I.; Ivanov, Alexandr A.; Fofanova, Tatyana S.; Mikhailov, Evgeny I.; Dianov, Ivan M.; Luzin, Pavel M.; Sergeev, Igor A.; Pankratova, Lidia A.; Krylova, Vera E.; and Leibenzon, Semen A., 4,350,482, Cl. 425-83.100.
Lemanski, Michael F.; Bremer, Noel J.; and Milberger, Ernest C., to Standard Oil Company, The. Preparation of vanadium phosphorus catalysts using olefinic halogenated organic reaction media. 4,350,611, Cl. 252-435.000.
Lemin, Norman P. Animal handling apparatus. 4,350,121, Cl. 119-103.000.
Leon, Harry I. Threading die couple. 4,349,931, Cl. 10-123.00P.
Leonian, Armen L., to Beckman Instruments, Inc. Centrifugal elutriator rotor. 4,350,283, Cl. 233-26.000.
Lescarden Ltd.: *See*—
Balassa, Leslie L., 4,350,682, Cl. 424-64.000.
Lessoff, Howard: *See*—
Bottka, Nicholas; and Lessoff, Howard, 4,350,413, Cl. 350-356.000.
Lestradet, Maurice C. J. Vehicle equipped with a liquid spreader device. 4,350,293, Cl. 239-155.000.
Leti, Andrea; and Valacca, Enrico, to Italtel Societa Italiana Telecomunicazioni S.p.A. Circuit arrangement for equalizing waveforms of push-pull power supply. 4,351,020, Cl. 363-26.000.
Liberman, Salomon, to ASEA Aktiebolag. Directional wave detector apparatus. 4,351,011, Cl. 361-82.000.
Liberty Vinyl Corporation: *See*—
Winther, Howard A., 4,349,926, Cl. 5-452.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Redlich, Horst; Borchard, Heinz; and Ihlenburg, Rainer, 4,351,047, Cl. 369-270.000.
Lignes Telegraphiques et Telephoniques: *See*—
Gregoire, Michel; and Vuillemin, Jean C., 4,351,059, Cl. 375-10.000.
Lind, Erwin, to Hoechst Aktiengesellschaft. Electrophotographic process for the manufacture of printing forms or printed circuits including transfer of photoconductive coating from temporary support. 4,350,748, Cl. 430-49.000.
Linde Aktiengesellschaft: *See*—
Drahtmuller, Hans-Dieter, 4,350,079, Cl. 91-499.000.
Lindner, Elek: *See*—
Geelhood, Bruce D.; Mastny, Gary F.; Solomon, Jerry E.; Wesley, Edward J.; Lindner, Elek; Dooley, Carol A.; and Lane, Sandra M., 4,350,890, Cl. 250-372.000.
Lion Corporation: *See*—
Nakamura, Masayoshi; Magari, Teruo; Abe, Seiji; and Yazaki, Mitsuyoshi, 4,350,619, Cl. 252-537.000.
Lipovsky, Iosif L.: *See*—
Kolesov, Evgeny V.; Smirnov, Boris A.; Fedotov, Vladimir M.; and Lipovsky, Iosif L., 4,350,160, Cl. 128-334.00R.
Lipton, Allan; and Kepner, Nancy, to Research Corporation. Platelet derived cell growth factor. 4,350,687, Cl. 424-177.000.
Liquid Control Incorporated: *See*—
Penn, Laurence R., 4,350,803, Cl. 528-10.000.
Lis, Ricardo B. Air conditioning apparatus for farming and animal husbandry activities industrial facilities and well-being in general. 4,350,085, Cl. 98-33.00A.
Liska, Donald J.; Schamaun, Roger G.; Clark, Donald C.; Potter, R. Christopher; and Frank, Joseph A., to United States of America, Energy. Drift tube suspension for high intensity linear accelerators. 4,350,921, Cl. 313-360.100.
Lisnyansky, Khaim, to International Paper Company. X-Ray fluorescent analysis with matrix compensation. 4,350,889, Cl. 378-46.000.
Little, Roger G., to Spire Corporation. Single crystal processes and products. 4,350,561, Cl. 156-624.000.
Liu, Chao-Ning: *See*—
Chow, Chao-Kong; Liu, Chao-Ning; and Wang, Sherman S., 4,350,045, Cl. 73-607.000.
Lizzi, Frederic L.; and Weil, Kurt W., to Riverside Research Institute. Frequency-controlled scanning of ultrasonic beams. 4,350,917, Cl. 310-320.000.
Lo, Wayne, to General Motors Corporation. Electrode for lead-salt diodes. 4,350,990, Cl. 357-16.000.
Lochte, Glen E.; and Allen, Jackie R., to FMC Corporation. Subsea pipe connector. 4,350,371, Cl. 285-18.000.
Loffland Brothers Company: *See*—
Mallory, Harvey E.; and Ward, James W., 4,350,505, Cl. 55-227.000.
Logan, John G.: *See*—
Jarrell, Donald, 4,350,587, Cl. 210-151.000.
Logsdon, Duane D. Expansion coupling for large diameter plastic pipes. 4,350,372, Cl. 285-45.000.
Loker, Aleck; and Archibald, Richard, to United States of America, Navy. System and method for measurement of dynamic angular or linear displacement. 4,350,041, Cl. 73-432.00R.
Lone Star Medical Products, Inc.: *See*—
Scott, F. Brantley, 4,350,151, Cl. 128-17.000.
Long, Eric L.: *See*—
Fillus, Gary C.; and Long, Eric L., 4,350,857, Cl. 200-314.000.
Longoni, Angelo: *See*—
Palvarini, Attilio; Lorusso, Simone; and Longoni, Angelo, 4,350,678, Cl. 424-27.000.
Lonza Ltd.: *See*—
Junek, Hans; and Thierrichter, Burkhard, 4,350,815, Cl. 546-115.000.
Junek, Hans; and Thierrichter, Burkhard, 4,350,816, Cl. 546-116.000.
Loose, Timothy C.: *See*—
Flaherty, John J.; Strauts, Eric J.; Wagerer, Helmut F.; and Loose, Timothy C., 4,351,031, Cl. 364-580.000.
Lord Corporation: *See*—
Schwemmer, Leonard J., 4,350,000, Cl. 53-287.000.
Lorntson, John M.: *See*—
Meguerian, Garbis H.; Lorntson, John M.; and Vasalos, Iacovos A., 4,350,615, Cl. 252-455.00Z.
Lorson, Emmett D.; and Minton, Keith G., to Hoover Company, The. Agitator for a cleaner or the like. 4,349,936, Cl. 15-366.000.
Lorusso, Simone: *See*—
Palvarini, Attilio; Lorusso, Simone; and Longoni, Angelo, 4,350,678, Cl. 424-27.000.
Lovisek, Louis J., to Industrial Fasteners Corp. Spider washer head screw. 4,350,465, Cl. 411-186.000.
Lowry, William D.: *See*—
Yargus, Lloyd A.; Switzer, Lester W., Sr.; Allen, Gary N.; Elliott, Gary S.; Yargus, Larry D.; Lowry, William D.; Gosnell, Jeffrey M.; and Spires, Darrell J., 4,350,444, Cl. 366-141.000.
Lucas Industries Limited: *See*—
Forrester, John S.; Swindell, David F.; and Wildsmith, Michael A., 4,350,971, Cl. 340-52.00R.
Mortimer, Ivan, 4,350,396, Cl. 303-115.000.
Seilly, Alec H., 4,350,954, Cl. 324-208.000.
Luchaco, David G.: *See*—
Spira, Joel S.; Luchaco, David G.; and Capewell, Dennis, 4,350,935, Cl. 315-291.000.
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LUK Lamellen und Kupplungsbau GmbH: *See*—
Geschka, Hugo W., 4,350,028, Cl. 68-13.00R.
Lukasik, Adam: *See*—
Biolik, Felicjan; Lukasik, Adam; Morys, Zagmunt; Walawender, Stanislaw; and Galazka, Szczepan, 4,351,057, Cl. 373-117.000.
Lund Hydromaskin AB: *See*—
Landaeus, Kjell G., 4,350,214, Cl. 173-126.000.
Lund Lures, Inc.: *See*—
Strantz, Ralph M., 4,349,979, Cl. 43-44.800.
Lundgren, Rolf B., to Sunds Defibrator Aktiebolag. Vapor separating method and apparatus. 4,350,499, Cl. 55-1.000.
Lundin, Robert S., to Superior Electric Company, The. Method of making a bobbin wound stepping motor. 4,349,957, Cl. 29-596.000.
Lundstrom, Gustaf B., to AB Volvo. Device for preventing icing in an air conditioning unit for motor vehicles. 4,350,021, Cl. 62-150.000.
Lunn, Gerald K.: *See*—
McGinn, Michael; and Lunn, Gerald K., 4,351,001, Cl. 358-158.000.
Lupertz, Hans-Henning, to ITT Industries, Inc. Pressure control unit. 4,350,395, Cl. 303-6.00C.
Lurssen, Klaus: *See*—
Beck, Gunther; Heitzer, Helmut; and Lurssen, Klaus, 4,350,520, Cl. 71-92.000.
Lutron Electronics Co., Inc.: *See*—
Spira, Joel S.; Luchaco, David G.; and Capewell, Dennis, 4,350,935, Cl. 315-291.000.
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Lutteke, Martin T.; and Lutteke, Gordon M., 4,350,222, Cl. 180-209.000.
Lutteke, Martin T.; and Lutteke, Gordon M. Variable tread vehicle. 4,350,222, Cl. 180-209.000.
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Gasser, Hermann; Curiger, Karl; and Novak, Peter, 4,350,007, Cl. 57-304.000.
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Alexandrov, Vyacheslav S.; Guschin, Alexandr E.; Zavodov, Rudolf V.; Zhukova, Elena I.; Ivanov, Alexandr A.; Fofanova, Tatyana S.; Mikhailov, Evgeny I.; Dianov, Ivan M.; Luzin, Pavel M.; Sergeev, Igor A.; Pankratova, Lidia A.; Krylova, Vera E.; and Leibenzon, Semen A., 4,350,482, Cl. 425-83.100.
Lydall, Inc.: *See*—
Wald, Stephen A.; and Carter, Robert W., 4,350,727, Cl. 428-102.000.
M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft: *See*—
Fischer, Hermann, 4,350,094, Cl. 101-350.000.
Simeth, Claus, 4,350,095, Cl. 101-365.000.
Ma, William H.: *See*—
Frieser, Rudolf G.; Ma, William H.; Ozols, Gunars M.; and Zingerman, Bryant N., 4,350,578, Cl. 204-192.00R.
Maas, Dieter: *See*—
Engelsmann, Dieter; Maas, Dieter; Zattler, Kurt; and Schultes, Herbert, 4,350,420, Cl. 354-145.000.
MacGregor, Douglas. Time-depth integrator. 4,350,042, Cl. 73-432.00R.
Mack Trucks, Inc.: *See*—
Kolarik, Oldrich S., 4,350,352, Cl. 277-216.000.
Mackey, Thomas E.: *See*—
Richards, Kennith E., 4,350,287, Cl. 237-12.30A.
Macomber, James K., to Macomber, James K. Physiological pillow. 4,349,925, Cl. 5-431.000.
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Yamashita, Nobuo; and Maeda, Miwako, 4,350,149, Cl. 128-6.000.

Maekawa, Tadashi, to Aisin Seiki Kabushiki Kaisha. Weather strip assembly for vehicle window. 4,349,994, Cl. 52-208.000.

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Montag, Bernhard; Mages, Gert; and Opitz, Heinrich, 4,350,757, Cl. 430-422.000.

Magnaflux Corporation: *See*—
Flaherty, John J.; Strauts, Eric J.; Wagerer, Helmut F.; and Loose, Timothy C., 4,351,031, Cl. 364-580.000.

Mahaffy & Harder Engineering Co.: *See*—
Mahaffy, Reid A.; and Hamilton, Joel A., 4,349,999, Cl. 53-128.000.

Mahaffy, Reid A.; and Hamilton, Joel A., to Mahaffy & Harder Engineering Co. Packaging techniques for semi-rigid packages. 4,349,999, Cl. 53-118.000.

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Maisotsenko, Valery S.; Tsimerman, Alexandr B.; and Zexer, Mikhail G. Water desalination method. 4,350,570, Cl. 203-10.000.

Malchesky, Paul S.; and Nose, Yukihiko, to Japan Foundation for Artificial Organs. Method and apparatus for on-line filtration removal of macromolecules from a physiological fluid. 4,350,156, Cl. 128-214.00R.

Mallory, Harvey E.; and Ward, James W., to Loffland Brothers Company. Device for reduction of oxygen content in drilling fluid. 4,350,505, Cl. 55-227.000.

Manba, Akio: *See*—
Kurosaki, Tomihiro; and Manba, Akio, 4,350,645, Cl. 260-978.000.

Mannesmann Demag, A.G.: *See*—
Wenzel, Jurgen-Michael, 4,350,241, Cl. 198-311.000.

Manville Service Corporation: *See*—
Olds, Leonard E., 4,351,054, Cl. 373-38.000.

Mappes, Celia J.: *See*—
Rentzea, Costin; Zeeh, Bernd; Pommer, Ernst-Heinrich; and Mappes, Celia J., 4,350,701, Cl. 424-269.000.

Margittai, Thomas. Doctoring knife for drum dryers and flakers. 4,349,934, Cl. 15-256.510.

Marino, Michael J.; and Marino, Michael R. Cutting guide and measuring device. 4,349,966, Cl. 33-489.000.

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Markle, James R. Auxiliary tool kit for a socket wrench set. 4,350,064, Cl. 81-437.000.

Marly, Jose: *See*—
Pardon, Pierre; Lantier, Frederic; Marly, Jose; and Bourgy, Gerard, 4,350,684, Cl. 424-92.000.

Marnette, Ewald: *See*—
Frank, Karl; and Marnette, Ewald, 4,350,018, Cl. 62-54.000.

Marrs, Ralph E. Acoustic energy systems. 4,350,724, Cl. 428-69.000.

Marschka, Frank D., to RCA Corporation. Main lens assembly for an electron gun. 4,350,925, Cl. 313-451.000.

Martel, Jacques; Tessier, Jean; and Teche, Andre, to Roussel Uclaf. Substituted lactones of amino acids. 4,350,637, Cl. 549-304.000.

Martin, A. Eugene. Manhole joint gasket assembly and joint formed therewith. 4,350,351, Cl. 277-207.00A.

Martin, Frank. Swivelling exhaust nozzles for rocket motors. 4,350,297, Cl. 239-265.350.

Marzola, Roberto; Garagnani, Enea; and Moro, Alessandro, to Montedison S.p.A. Process for promoting the adhesion of polyolefins to metals, glass sheets, cement, asbestos or polar polymers. 4,350,797, Cl. 525-293.000.

Maschinenfabrik Meyer AG: *See*—
Hartinger, Edmund; Julke, Elias; and Sandmann, Harald, 4,350,620, Cl. 252-628.000.

Maschke, Alfred W., to United States of America, Energy. Means for the focusing and acceleration of parallel beams of charged particles. 4,350,927, Cl. 315-5.410.

Masclet, Jean. Fishing reel. 4,350,312, Cl. 242-84.20G.

Masegi, Koichi, to Canon Kabushiki Kaisha. Recording apparatus for effecting recording by a beam. 4,350,988, Cl. 346-108.000.

Masoero, Renzo: *See*—
Dotti, Giulio; and Masoero, Renzo, 4,350,354, Cl. 280-6.00H.

Mason, Iain M.: *See*—
Buchanan, David J.; and Mason, Iain M., 4,351,035, Cl. 367-14.000.

Massachusetts Institute of Technology: *See*—
von Schulthess, Gustav K.; Cohen, Richard J.; and Benedek, George B., 4,350,677, Cl. 424-12.000.
Yannas, Ioannis V.; and Forbes, Martin J., 4,350,629, Cl. 260-123.700.

Mastny, Gary F.: *See*—
Geelhood, Bruce D.; Mastny, Gary F.; Solomon, Jerry E.; Wesley, Edward J.; Lindner, Elek; Dooley, Carol A.; and Lane, Sandra M., 4,350,890, Cl. 250-372.000.

Masuda, Shunichi: *See*—
Yagasaki, Toshiaki; Masuda, Shunichi; Shimizu, Katsuichi; and Sakamaki, Hisashi, 4,350,436, Cl. 355-14.0SH.

Masuho, Yasuhiko; and Hara, Takeshi, to Teijin Limited. Antitumor hybrid and process for the preparation thereof. 4,350,626, Cl. 260-112.50R.

Masuko, Tatsuo; Fukaya, Shigeo; Murai, Nobuyuki; and Noma, Jun, to Mitsubishi Chemical Industries, Limited. Process for preparing isobutyric acid. 4,350,829, Cl. 562-531.000.

Matsko, Joseph J.; Wafer, John A.; Engel, Joseph C.; and Mercier, Bernard J., to Westinghouse Electric Corp. Circuit interrupter with multiple display and parameter entry means. 4,351,013, Cl. 361-96.000.

Matsuda, Akira; Havakawa, Yoshihiro; Yasuda, Shigeo; Iwasaki, Motoaki; and Nishino, Hiroshi, to Bridgestone Tire Company Limited; and Mitaka Instrument Company Limited. Pressure-sensitive switch unit in resonator assembly of tire pressure drop detecting apparatus. 4,350,854, Cl. 200-61.250.

Matsuda, Shimpei; Kato, Akira; Mori, Toshikatsu; Kumagai, Teruo; Hishinuma, Yukio; Akimoto, Hidetoshi; and Nakajima, Fumito, to Hitachi, Ltd.; and Babcock-Hitachi Kabushiki Kaisha. Process for treating flue gas. 4,350,670, Cl. 423-244.000.

Matsuda, Yasumasa: *See*—
Sagae, Syoji; Matsuda, Yasumasa; Kasahara, Masatoshi; and Suzuki, Masayoshi, 4,350,989, Cl. 346-140.00R.

Matsugichi, Michiharu: *See*—
Hiyoshi, Kazuhiko; Matsuura, Norio; Matsugichi, Michiharu; Onofusa, Norio; and Nishikage, Tadao, 4,350,622, Cl. 524-831.000.

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Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; Tsunoda, Atsuo; Midorikawa, Koyo; Murase, Hidetoshi; Suzuta, Mikio; and Moriwaki, Masazumi, 4,350,431, Cl. 355-1.000.

Matsuki, Junya: *See*—
Uenosono, Chikasa; Okada, Takao; Matsuki, Junya; Naito, Tadashi; Inoue, Shinichiro; and Takahashi, Masaki, 4,350,947, Cl. 322-17.000.

Matsumoto, Hajime: *See*—
Hayasaka, Yoshiyuki; Ikeuchi, Ichiro; Matsumoto, Hajime; and Shikaya, Yukihiro, 4,349,997, Cl. 53-51.000.

Matsumoto, Hiroshi: *See*—
Ogata, Masaru; and Matsumoto, Hiroshi, 4,350,635, Cl. 260-326.470.

Matsumoto, Makoto: *See*—
Tsujimoto, Eiichi; Hirahara, Hiroshi; and Matsumoto, Makoto, 4,350,004, Cl. 53-570.000.

Matsunaga, Kazu: *See*—
Awazu, Kenzo; and Matsunaga, Kazu, 4,350,604, Cl. 252-301.40R.

Matsuno, Yoshio, to Nissan Motor Co., Ltd. Method of manufacturing a padded panel. 4,350,544, Cl. 156-79.000.

Matsuo, Takeshi: *See*—
Kuwabara, Eiji; Sakata, Takayoshi; Kawauchi, Noboru; Ide, Yuuichi; and Matsuo, Takeshi, 4,350,023, Cl. 62-176.00E.

Matsushita Electric Industrial Co., Ltd.: *See*—
Hasegawa, Yo; Yasuda, Shigeru; and Kojima, Kunio, 4,350,741, Cl. 428-473.500.
Imanaka, Ryoichi; and Tsuji, Seizou, 4,351,044, Cl. 369-43.000.
Nishino, Atsushi; Kimura, Kunio; Sonetaka, Kazunori; and Takeuchi, Yasuhiro, 4,350,613, Cl. 252-455.00R.
Takagi, Masaharu; and Nishida, Yoshinori, 4,350,868, Cl. 219-137.00R.
Ueda, Shigeki, 4,350,860, Cl. 219-10.55B.
Yamashita, Toshio; Gamo, Takaharu; Moriwaki, Yoshio; and Fukuda, Masataro, 4,350,673, Cl. 423-644.000.

Matsuura, Norio: *See*—
Hiyoshi, Kazuhiko; Matsuura, Norio; Matsugichi, Michiharu; Onofusa, Norio; and Nishikage, Tadao, 4,350,622, Cl. 524-831.000.

Matsuzaka, Syozi: *See*—
Koitabashi, Takeo; Matsuzaka, Syozi; Iijima, Toshifumi; and Harada, Tetsuya, 4,350,758, Cl. 430-567.000.

Mattel, Inc.: *See*—
Kilroy, Eugene J.; Kelley, William J.; and Crain, Philip W., 4,349,983, Cl. 46-12.000.

Matthews, Michael R.; Newman, David H.; Smith, David R.; and Steventon, Alan G., to Post Office, The. Self saturating semiconductor lasers. 4,350,960, Cl. 372-46.000.

Mattox, Darryl F. Air cushion vehicle. 4,350,107, Cl. 114-67.00A.

Maurer, Fritz: *See*—
Fuchs, Rainer; Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, 4,350,640, Cl. 260-465.00D.
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Mavretic, Anton, to Avitar, Inc. Weighing devices using electronic circuitry. 4,350,216, Cl. 177-164.000.

Maxey, Robert E. L.; and Brecker, James N., to Westinghouse Electric Corp. Tool life monitoring and tracking apparatus. 4,351,029, Cl. 364-511.000.

May, Randall L. Football practice aid. 4,350,338, Cl. 273-55.00B.

Mayer, Nathan, to Hartford Corporation, The. Releasable surgical products and process of formation thereof. 4,350,246, Cl. 206-210.000.

Mazal, Charles N. Pneumatic pulsatile fluid pump. 4,350,477, Cl. 417-384.000.

McAlister, Roy E. Extrusion apparatus for making stabilized polyester. 4,350,663, Cl. 422-137.000.

McCambridge, James; and Hettinga, Siebolt, to Central Quality Industries, Inc. Power tool accessory table. 4,350,193, Cl. 144-286.00R.

McCarthy, Thomas D. Lock device and method for securing window sashes in a fixed relative position. 4,350,377, Cl. 292-288.000.

McCaully, Ronald J.: *See*—
Kim, Dong H.; and McCaully, Ronald J., 4,350,633, Cl. 260-326.11R.

McChesney, William G.: *See*—
Grandia, Johannes; McChesney, William G.; Santini, Hugo A. E.; and Turk, Harold L., 4,350,116, Cl. 118-500.000.

McClure, George W.; and Milenkovic, Veljko, to Ford Motor Company. Control for automatic machine tool drive. 4,350,941, Cl. 318-603.000.

McColl, Bruce J., to Owens-Illinois, Inc. Self propelled, off road vehicle. 4,350,190, Cl. 144-3.00D.

McConnell, Richard L.; Trotter, Jimmy R.; and Jones, Glenn C., to Eastman Kodak Company. Copolyester compositions. 4,350,807, Cl. 528-302.000.

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McCoy, David R.: *See—*
Dominguez, Richard J. G.; and McCoy, David R., 4,350,779, Cl. 521-126.000.

McCoy, Terence D.: *See—*
Farr, Garth M.; McCoy, Terence D.; and Dlask, Jiri, 4,350,062, Cl. 81-57.180.

McCrary, Jack L.: *See—*
Mosier, Benjamin; McCrary, Jack L.; and Guilbeau, Karl G., 4,350,601, Cl. 252-8.55R.

McDonald, Glen E., to United States of America, National Aeronautics and Space Administration. Method for depositing an oxide coating. 4,350,574, Cl. 204-56.00R.

McElwain, John A. Solar energy collector and system. 4,350,200, Cl. 165-48.00S.

McFadyen, Robert J.: *See—*
Peil, William; and McFadyen, Robert J., 4,350,930, Cl. 315-49.000.

McGinn, Michael; and Lunn, Gerald K., to Motorola, Inc. Horizontal phase lock loop for television. 4,351,001, Cl. 358-158.000.

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Holzhauser, Ronald C.; McGlen, James A.; and Russel, Matthew J., 4,350,329, Cl. 271-9.000.

McKee, James E. Rodent exterminating apparatus. 4,349,980, Cl. 43-81.000.

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Edwards, Philip N.; and McMenim, Michael E., 4,350,826, Cl. 562-444.000.

McMurtry, David R. Tool connecting mechanism. 4,349,946, Cl. 29-57.000.

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Huang, Shih L.; McQuillen, Edward J.; and Richey, Robert J., Jr., 4,350,728, Cl. 428-105.000.

McTavish, James C., to Robertson, Harry A., Jr. Rod packing. 4,350,349, Cl. 277-199.000.

McWilliams, Joseph A., to Micropore International Ltd. Radiant heating elements for smooth top cookers. 4,350,875, Cl. 219-449.000.

Mechanical Technology Incorporated: *See—*
Folsom, Lawrence R.; and Dineen, John J., 4,350,012, Cl. 60-520.000.

Medtronic, Inc.: *See—*
Dutcher, Robert G.; and Upton, James E., 4,350,169, Cl. 128-783.000.
Thompson, Howard J., 4,350,155, Cl. 128-213.00R.

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Mehlberg, Robert L., to Purdue Research Foundation. Pentose syrup production from hemicellulose. 4,350,766, Cl. 435-161.000.

Mendes, Paul V. Acid bath apparatus. 4,350,553, Cl. 156-345.000.

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Elms, Robert T.; Engel, Joseph C.; Mercier, Bernard J.; Saletta, Gary F.; and Wilson, John T., 4,351,012, Cl. 361-96.000.
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Merck & Co., Inc.: *See—*
Christensen, Burton G.; and Shih, David H., 4,350,631, Cl. 260-245.20T.
Kang, Kenneth S.; and Veeder, George T., 4,350,769, Cl. 435-243.000.

Merck, Howard W., to Frito-Lay, Inc. Apparatus and method for selectively ejecting malformed articles. 4,350,251, Cl. 209-642.000.

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Gunkel, Werner, 4,350,595, Ci. 210-656.000.

Meroni, Umberto, to Societa Italiana Telecomunicazioni Stemens S.p.A. Voltage-step-down circuit with chopping transistor for D-C power supply. 4,350,948, Cl. 323-282.000.

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Blaha, Alfred; and Schwarzler, Hans-Juergen, 4,350,983, Cl. 343-103.000.

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Rasshofer, Werner; Grogler, Gerhard; and Meyborg, Holger, 4,350,781, Cl. 521-149.000.

Meywald, Klaus; and Ohnmacht, Helmut, to Fritz Eichenauer, Firma. Electrical heating element for fluid media and method for producing same. 4,350,872, Cl. 219-376.000.

MGS Machine Corporation: *See—*
Bahr, Melford J.; and Geist, Wayne R., 4,350,466, Cl. 414-128.000.

Miano, Henry: *See—*
Santoro, Dario S.; Schultz, Garry; and Miano, Henry, 4,350,508, Cl. 55-275.000.

Michaels, Leonard H., to Ideal Industries, Inc. Cord grip. 4,350,840, Cl. 174-65.0SS.

Michaelson, Gary L., to Boeing Company, The. Fluid slip sheet and method. 4,350,551, Cl. 156-245.000.

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Hall, William H.; and Saul, John R., 4,350,845, Cl. 179-1.00J.

Micropore International Ltd.: *See—*
McWilliams, Joseph A., 4,350,875, Cl. 219-449.000.

Miculka, Zdenek: *See—*
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Middleditch, Stanley W., to De La Rue Systems Limited. Sheet counting apparatus. 4,350,331, Cl. 271-95.000.

Midland-Ross Corporation: *See—*
Hanula, Richard M.; and Kulieke, Fred C., Jr., 4,350,256, Cl. 213-69.000.

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Cannavo, Christian G.; Cousin, Georges; Espagnacq, Andre; Frayssac, Jacques X.; Laine, Loic Y.; Midrouillet, Daniel J.; Pintenat, Andre M.; and Reboux, Jean B., 4,350,096, Cl. 102-209.000.

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Alexandrov, Vyacheslav S.; Guschin, Alexandr E.; Zavodov, Rudolf V.; Zhukova, Elena I.; Ivanov, Alexandr A.; Fofanova, Tatyana S.; Mikhailov, Evgeny I.; Dianov, Ivan M.; Luzin, Pavel M.; Sergeev, Igor A.; Pankratova, Lidia A.; Krylova, Vera E.; and Leibenzon, Semen A., 4,350,482, Cl. 425-83.100.

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Lemanski, Michael F.; Bremer, Noel J.; and Milberger, Ernest C., 4,350,611, Cl. 252-435.000.

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McClure, George W.; and Milenkovic, Veljko, 4,350,941, Cl. 318-603.000.

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Conlon, Ralph D.; Miles, Stanley F.; and Paradis, Roland C., 4,350,586, Cl. 210-149.000.

Miller, Alan L.; and Ivey, John S., to Borg-Warner Corporation. Transmission control system for multi-ratio gear arrangement. 4,350,058, Cl. 74-866.000.

Miller, John C.: *See—*
Jones, David N.; Burnett, Archibald L; and Miller, John C., 4,350,657, Cl. 264-349.000.

Miller, Joseph N., to Jackes-Evans Manufacturing Company. Blow back prevention apparatus for a wood-burning stove. 4,350,141, Cl. 126-287.000.

Milner, David J.: *See—*
Holland, David; and Milner, David J., 4,350,811, Cl. 536-18.000.

Milstein, Cesar: *See—*
Galfre, Giovanni; Milstein, Cesar; and Wright, Bruce W., 4,350,683, Cl. 424-85.000.

Minami, Setsuo: *See—*
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Miner, Thomas G.: *See—*
Albright, Jay D.; Miner, Thomas G.; and Shepherd, Robert G., 4,350,822, Cl. 560-45.000.

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Conrad, Lawrence H., 4,350,415, Cl. 350-422.000.
Randklev, Ronald M., 4,350,532, Cl. 106-30.000.
Stevens, John; and Newman, Stephen, 4,350,644, Cl. 260-501.150.
Youngquist, Robert J., 4,351,007, Cl. 360-13.000.

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Hanada, Yoshihiro; and Tottori, Takafumi, 4,350,269, Cl. 222-227.000.
Ueda, Hiroshi; and Oyokota, Shigeru, 4,350,421, Cl. 354-152.000.

Minott, Peter O., to United States of America, National Aeronautics and Space Administration. Multiprism collimator. 4,350,410, Cl. 350-170.000.

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Busse, Vernon E.; and Schockman, Robert L., 4,350,090, Cl. 100-216.000.

Minton, Keith G.: *See—*
Lorson, Emmett D.; and Minton, Keith G., 4,349,936, Cl. 15-366.000.

Minyashkin, Dmitry P.: *See—*
Antipov, Georgy A.; Gelfand, Mikhail L.; Tsipenjuk, Yakov I.; Goldshtein, Boris G.; Lavnikov, Nikolai S.; Teres, Leonid N.; Urazhdin, Ivan I.; Yakubovsky, Petr S.; Boiko, Vitaly T.; Kalmykov, Anatoly M.; Minyashkin, Dmitry P.; and Stepanov, Mikhail M., 4,350,213, Cl. 173-93.600.

Misono, Masayoshi, to Hitachi, Ltd. Color picture tube. 4,350,924, Cl. 313-441.000.

Mita, Ryuichi: *See—*
Nagai, Shosuke; Kato, Toshio; Iguchi, Chojiro H.; Kawashima, Nobuyuki; Mita, Ryuichi; Yamaguchi, Akihiro; and Takano, Takao, 4,350,643, Cl. 260-465.700.

Mitaka Instrument Company Limited: *See—*
Matsuda, Akira; Havakawa, Yoshihiro; Yasuda, Shigeo; Iwasaki, Motoaki; and Nishino, Hiroshi, 4,350,854, Cl. 200-61.250.

Mitani, Hiroshi: *See*—
Hamada, Isao; Nakayama, Hiroshi; Kawakami, Nobuyoshi; Azami, Hirotaka; Ikeda, Tadasu; Yukawa, Yasumasa; Mitani, Hiroshi; Ohmori, Takashi; Kimura, Masanobu; and Seno, Kohichi, 4,350,510, Cl. 55-349.000.

Mitsuba Electric Mfg. Co., Ltd.: *See*—
Yamada, Masahide, 4,350,909, Cl. 310-62.000.

Mitsubishi Chemical Industries, Limited: *See*—
Itagaki, Takaharu; and Ouchi, Hidenaga, 4,350,773, Cl. 521-31.000.
Masuko, Tatsuo; Fukaya, Shigeo; Murai, Nobuyuki; and Noma, Jun, 4,350,829, Cl. 562-531.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Awazu, Kenzo; and Matsunaga, Kazu, 4,350,604, Cl. 252-301.40R.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Isogai, Nobuo; Okawa, Takashi; Hosokawa, Motoyuki; Watanabe, Toshiyasu; and Wakui, Natsuko, 4,350,668, Cl. 423-139.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Hayasaka, Yoshiyuki; Ikeuchi, Ichiro; Matsumoto, Hajime; and Shikaya, Yukihiro, 4,349,997, Cl. 53-51.000.
Izumi, Jun; and Murakami, Nobuaki, 4,350,669, Cl. 423-235.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Ogawa, Hiroshi, 4,350,390, Cl. 297-452.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Nagai, Shosuke; Kato, Toshio; Iguchi, Chojiro H.; Kawashima, Nobuyuki; Mita, Ryuichi; Yamaguchi, Akihiro; and Takano, Takao, 4,350,643, Cl. 260-465.700.

Mitsui, Yoshiaki: *See*—
Yanagisawa, Yasuo; and Mitsui, Yoshiaki, 4,350,877, Cl. 235-70.00A.

Miyahara, Junji: *See*—
Takahashi, Kenji; and Miyahara, Junji, 4,350,893, Cl. 250-484.100.

Miyakawa, Seiichi: *See*—
Ohnuma, Teruyuki; Miyakawa, Seiichi; and Oyama, Hajime, 4,350,749, Cl. 430-100.000.

Miyake, Hidekazu: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,350,700, Cl. 424-263.000.

Miyamoto, Yukihiko, to Trio Kabushiki Kaisha. Pulse counter-type FM detector. 4,350,957, Cl. 329-107.000.

Miyazaki, Kiyoshi; Takeuchi, Tsuneto; Ito, Jinichi; and Ashibe, Hiroo, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Motor speed control device for DC motor. 4,350,937, Cl. 318-331.000.

Mizuno, Yasuhiko; and Kayano, Masanori, to Eisai Co., Ltd. Soft capsule coated with a film of carnauba wax and process for the preparation of the same. 4,350,679, Cl. 424-38.000.

Mizushima, Yoshihiko; Takeda, Akitsu; Yoshikawa, Akira; Ochi, Osamu; and Hisaki, Tomoko, to Nippon Telegraph & Telephone Public Corp. Doping from a photoresist layer. 4,350,541, Cl. 148-188.000.

Mlikotin, Alexander T. Multi-purpose plumbing tool. 4,349,928, Cl. 7-157.000.

Mobarry, John W., to Honeywell Inc. Apnea detector. 4,350,166, Cl. 128-664.000.

Mobay Chemical Corporation: *See*—
Schmelzer, Hans G.; Schmidt, Manfred; and Yeater, Robert P., 4,350,799, Cl. 525-453.000.

Mobil Oil Company: *See*—
Yan, Tsoung-Yuan, 4,350,391, Cl. 299-4.000.

Mobil Oil Corporation: *See*—
Chester, Arthur W.; and Chu, Yung F., 4,350,835, Cl. 585-415.000.
Schwartz, Albert B., 4,350,614, Cl. 252-455.00Z.

Mochizuki, Daisuke; and Kitano, Shigeru, to Sharp Kabushiki Kaisha. Modulator for use in an interface between a digital signal processing apparatus and an audio tape deck. 4,351,008, Cl. 360-40.000.

Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; Tsunoda, Atsuo; Midorikawa, Koyo; Murase, Hidetoshi; Suzuta, Mikio; and Moriwaki, Masazumi, to Canon Kabushiki Kaisha. Projecting device. 4,350,431, Cl. 355-1.000.

Moertel, George B., to Talon, Inc. Slide fastener stringer elements with tongues and grooved heads. 4,349,943, Cl. 24-205.13R.

Moertel, George B., to Talon, Inc. Method and apparatus for continuous molding of articles. 4,350,656, Cl. 264-166.000.

Mohiuddin, Gulam, to International Telephone and Telegraph Corporation. Molded plastic part. 4,350,739, Cl. 428-425.100.

Mojonnier, Harry G.: *See*—
Skoli, Sigmund P.; Kemp, David M.; and Mojonnier, Harry G., 4,350,503, Cl. 55-165.000.

Molins Limited: *See*—
Hinchcliffe, Dennis; Starkey, Stanley V.; and Stone, William A., 4,350,242, Cl. 198-605.000.

Moll, Thorleif, to Cinderella AB. Heating system. 4,350,024, Cl. 62-238.600.

Moller, Rudolf: *See*—
Gottling, Helmut; and Moller, Rudolf, 4,350,182, Cl. 137-625.270.

Mollere, John C., to Western Geophysical Co. of America. Submarine cable connector link. 4,351,036, Cl. 367-20.000.

Molter, Michael; and Kloss, Gerhard, to Hoechst Aktiengesellschaft. Substituted acetanilidoiminodiacetic acid compounds, diagnostic agents containing such compounds labeled with technetium-99m, and methods for making and using such compounds and agents. 4,350,674, Cl. 424-1.000.

Monarch Marking Systems, Inc.: *See*—
Pabodie, Robert M., 4,350,554, Cl. 156-384.000.

Moncur, Marlowe V., to Monsanto Company. High-impact polyamide molding and extrusion resin compositions. 4,350,794, Cl. 525-183.000.

Monsanto Company: *See*—
Coran, Aubert Y.; and Patel, Raman, 4,350,740, Cl. 428-461.000.
Heisner, Donald N.; and Bentivegna, Charles R., 4,350,942, Cl. 318-626.000.
Moncur, Marlowe V., 4,350,794, Cl. 525-183.000.

Montag, Bernhard; Mages, Gert; and Opitz, Heinrich, to Siemens Aktiengesellschaft. Method for making visible residual moisture distributions in photographic wet film layers subjected to an oncoming flow. 4,350,757, Cl. 430-422.000.

Montedison S.p.A.: *See*—
Marzola, Roberto; Garagnani, Enea; and Moro, Alessandro, 4,350,797, Cl. 525-293.000.
Palvarini, Attilio; Lorusso, Simone; and Longoni, Angelo, 4,350,678, Cl. 424-27.000.

Moon, James: *See*—
Decker, Elmer L.; and Moon, James, 4,349,952, Cl. 29-402.060.

Moore, Daniel J.; and Pascoe, Robert A., to International Business Machines Corp. High speed basic and condensed tab racks. 4,350,455, Cl. 400-279.000.

Moorehead, David R.; and Davis, Michael, to CSR Limited. Method of producing a building element. 4,350,567, Cl. 162-145.000.

Moreau, Roland; and Potvin, Robert. Motorized floatboard. 4,350,113, Cl. 114-270.000.

Morell, Antoinette; and Hermosin, Antonio, to Thomson-CSF. Process for the rapid sintering of ceramic components and a kiln for carrying out said process. 4,350,651, Cl. 264-65.000.

Morgan, Morris H.: *See*—
Jones, Thomas B.; Morgan, Morris H.; and Dietz, Peter W., 4,349,967, Cl. 34-1.000.

Morgan, Richard T. Portable bag for pet supplies. 4,350,274, Cl. 224-205.000.

Mori, Goro: *See*—
Suzuki, Shigeru; Suzuki, Minoru; Suzuki, Koichi; Omi, Kyoji; Nagahara, Yasumori; Kagari, Yoshiharu; Hashimoto, Makoto; and Mori, Goro, 4,350,750, Cl. 430-125.000.

Mori, Kouichi: *See*—
Yoshinaga, Toru; Igashira, Toshihiko; Mori, Kouichi; Kawai, Hisasi; and Morino, Seiji, 4,350,137, Cl. 123-617.000.

Mori, Toshikatsu: *See*—
Matsuda, Shimpei; Kato, Akira; Mori, Toshikatsu; Kumagai, Teruo; Hishinuma, Yukio; Akimoto, Hidetoshi; and Nakajima, Fumito, 4,350,670, Cl. 423-244.000.

Morihisa, Mitsuo; and Inoue, Tadao, to Sharp Kabushiki Kaisha. Power supply/auto-clear circuit. 4,351,021, Cl. 363-49.000.

Morimoto, Masao, to Sanyo Electric Co., Ltd. Electric fan apparatus. 4,350,472, Cl. 415-125.000.

Morinaga, Akio: *See*—
Zenbayashi, Katsuaki; Morinaga, Akio; Hirayama, Masao; and Morita, Akira, 4,350,548, Cl. 156-156.000.

Morino, Seiji: *See*—
Yoshinaga, Toru; Igashira, Toshihiko; Mori, Kouichi; Kawai, Hisasi; and Morino, Seiji, 4,350,137, Cl. 123-617.000.

Morino, Yukio: *See*—
Kitai, Kiyoshi; Morino, Yukio; Kato, Shogo; and Watanabe, Masanori, 4,350,427, Cl. 354-238.000.

Morishita, Teru: *See*—
Sugiyama, Matsuyoshi; Morishita, Teru; and Suzuki, Toshikazu, 4,350,304, Cl. 239-703.000.

Morita, Akira: *See*—
Zenbayashi, Katsuaki; Morinaga, Akio; Hirayama, Masao; and Morita, Akira, 4,350,548, Cl. 156-156.000.

Moriwaki, Masazumi: *See*—
Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; Tsunoda, Atsuo; Midorikawa, Koyo; Murase, Hidetoshi; Suzuta, Mikio; and Moriwaki, Masazumi, 4,350,431, Cl. 355-1.000.

Moriwaki, Yoshio: *See*—
Yamashita, Toshio; Gamo, Takaharu; Moriwaki, Yoshio; and Fukuda, Masataro, 4,350,673, Cl. 423-644.000.

Moriyama Sangyo Kabushiki Kaisha: *See*—
Katoogi, Masayuki, 4,350,929, Cl. 315-49.000.

Moro, Alessandro: *See*—
Marzola, Roberto; Garagnani, Enea; and Moro, Alessandro, 4,350,797, Cl. 525-293.000.

Mortimer, Ivan, to Lucas Industries Limited. Modulator assemblies for vehicle anti-skid braking systems. 4,350,396, Cl. 303-115.000.

Mortimer, Thomas J., to Sanders Associates, Inc. Video formatted digital data transmission method and apparatus. 4,350,999, Cl. 358-147.000.

Morton, Anthony J.: *See*—
Harvey, Kenneth; Hayes, Harry; and Morton, Anthony J., 4,350,680, Cl. 424-52.000.

Morys, Zagmunt: *See*—
Biolik, Felicjan; Lukasik, Adam; Morys, Zagmunt; Walawender, Stanislaw; and Galazka, Szczepan, 4,351,057, Cl. 373-117.000.

Mosier, Benjamin; McCrary, Jack L.; and Guilbeau, Karl G., to Dow Chemical Co., The. Preparation of viscosifiers for zinc salt workover and completion brines. 4,350,601, Cl. 252-8.55R.

Moskowitz, Howard: *See*—
Knauer, Joseph; and Moskowitz, Howard, 4,350,337, Cl. 273-43.00A.

Motorola, Inc.: *See*—
McGinn, Michael; and Lunn, Gerald K., 4,351,001, Cl. 358-158.000.
Pagnamenta, Antonio, 4,350,958, Cl. 330-286.000.

Motoyama, Kazuyasu: *See—*
Osada, Hajime; Kimura, Akiteru; Shimizu, Tokuo; Kitajima, Goro; Tomizawa, Yoshio; Kondo, Makoto; Motoyama, Kazuyasu; and Daigaku, Masaaki, 4,351,009, Cl. 360-105.000.

Moxley, Bruce: *See—*
Knight, Lindsay C.; Phillips, Robert B.; Bowyer, William H.; and Moxley, Bruce, 4,350,881, Cl. 235-400.000.

Mueller, John H., to Grove Truseal Valve Company. High torque plug valve actuator. 4,350,322, Cl. 251-229.000.

Muller, Alois. Vending machine for flat sheet articles. 4,350,264, Cl. 221-67.000.

Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, to Thyssen Industrie AG. Method for manufacturing metal casings for accessories and particularly gate valves. 4,349,948, Cl. 29-157.10R.

Muller, Hans, to Grapha-Holding AG. Apparatus for removing successive sheets from a stack of overlapping sheets. 4,350,327, Cl. 270-54.000.

Muller, Jakob; and Diesner, Ferdinand. Shuttleless weaving machine. 4,350,184, Cl. 139-448.000.

Muller, Wolfgang: *See—*
Heberling, Walter; Muller, Wolfgang; Langenberg, Werner; Behrens, Gerhard; and Saul, Alfred, 4,350,393, Cl. 299-50.000.

Murahara, Koichi; and Yasunaga, Teibun, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Fountain pen with battery operated supply detector and ink pressurizing device. 4,350,458, Cl. 401-145.000.

Murai, Nobuyuki: *See—*
Masuko, Tatsuo; Fukaya, Shigeo; Murai, Nobuyuki; and Noma, Jun, 4,350,829, Cl. 562-531.000.

Murakami, Nobuaki: *See—*
Izumi, Jun; and Murakami, Nobuaki, 4,350,669, Cl. 423-235.000.

Murase, Hidetoshi: *See—*
Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; Tsunoda, Atsuo; Midorikawa, Koyo; Murase, Hidetoshi; Suzuta, Mikio; and Moriwaki, Masazumi, 4,350,431, Cl. 355-1.000.

Murdoch, Robert: *See—*
Westwood, Robert; Tully, Wilfred R.; and Murdoch, Robert, 4,350,695, Cl. 424-251.000.

Murillo, Hernando. Wheel truck. 4,350,470, Cl. 414-430.000.

Murphy, James T. Tide following wave power machine. 4,350,474, Cl. 416-7.000.

Murray, David E.: *See—*
Burch, Jeremy R.; and Murray, David E., 4,350,756, Cl. 430-331.000.

MX-Processor Reinhardt & Co AB: *See—*
Andersson, Sven O. S.; Ottertun, Harald D.; and Reinhardt, Hans, 4,350,667, Cl. 423-24.000.

Myles, J. Edgar, to J. E. Myles, Inc. Crank press with hydraulic transmission. 4,350,091, Cl. 100-271.000.

N. Schlumberger & Cie: *See—*
Herubel, Jean-Frederic, 4,350,624, Cl. 260-112.00R.

Naegeli, Werner. Animal gate, training membranes and method of training the animal to use such gate. 4,350,198, Cl. 160-179.000.

Nagahara, Yasumori: *See—*
Suzuki, Shigeru; Suzuki, Minoru; Suzuki, Koichi; Omi, Kyoji; Nagahara, Yasumori; Kagari, Yoshiharu; Hashimoto, Makoto; and Mori, Goro, 4,350,750, Cl. 430-125.000.

Nagai, Shosuke; Kato, Toshio; Iguchi, Chojiro H.; Kawashima, Nobuyuki; Mita, Ryuichi; Yamaguchi, Akihiro; and Takano, Takao, to Mitsui Toatsu Chemicals, Inc. Process for producing 2,3-dihalopropionitrile. 4,350,643, Cl. 260-465.700.

Nagase, Jiro, to Nagase Rubber Co., Ltd. Collapsible indoor sports mats. 4,350,721, Cl. 428-33.000.

Nagase Rubber Co., Ltd.: *See—*
Nagase, Jiro, 4,350,721, Cl. 428-33.000.

Nagoshi, Mitsuru: *See—*
Katakura, Hiroshi; and Nagoshi, Mitsuru, 4,350,328, Cl. 271-22.000.

Nagumo, Shin-ichi: *See—*
Nakajima, Yasuo; Hayashi, Yoshimasa; Nagumo, Shin-ichi; and Yoshimura, Tooru, 4,350,129, Cl. 123-440.000.

Naito, Tadashi: *See—*
Uenosono, Chikasa; Okada, Takao; Matsuki, Junya; Naito, Tadashi; Inoue, Shinichiro; and Takahashi, Masaki, 4,350,947, Cl. 322-17.000.

Nakajima, Fumito: *See—*
Matsuda, Shimpei; Kato, Akira; Mori, Toshikatsu; Kumagai, Teruo; Hishinuma, Yukio; Akimoto, Hidetoshi; and Nakajima, Fumito, 4,350,670, Cl. 423-244.000.

Nakajima, Yasuo; Hayashi, Yoshimasa; Nagumo, Shin-ichi; and Yoshimura, Tooru, to Nissan Motor Company, Limited. Spark-ignition internal combustion engine capable of preventing noxious gas emissions. 4,350,129, Cl. 123-440.000.

Nakajima, Yoshikage: *See—*
Hamano, Sachiyuki; Kitamura, Shinichi; Igarashi, Toshiji; and Nakajima, Yoshikage, 4,350,705, Cl. 424-278.000.

Nakamura, Masashi: *See—*
Fujii, Hiroo; Tanaka, Kiyoaki; Nakamura, Masashi; Okuno, Ryuzo; Hashizume, Shigeyuki; Katayama, Hideo; and Fujita, Tsutomu, 4,350,326, Cl. 266-201.000.

Nakamura, Masayoshi; Magari, Teruo; Abe, Seiji; and Yazaki, Mitsuyoshi, to Lion Corporation. Granular detergent containing zeolite, silicate, LAS and olefin sulfonate. 4,350,619, Cl. 252-537.000.

Nakanishi, Kiyoshi: *See—*
Kanda, Mutsumi; Nakanishi, Kiyoshi; and Inoue, Tokuta, 4,350,125, Cl. 123-261.000.

Nakano, Hirotaka; and Yano, Kensaku, to Tokyo Shibaura Denki Kabushiki Kaisha. Patterned layer article and manufacturing method therefor. 4,350,729, Cl. 428-209.000.

Nakano, Motoo; and Ogawa, Tsutomu, to Fujitsu Limited. Method of producing dynamic random-access memory cells. 4,350,536, Cl. 148-1.500.

Nakasone, Henry H.: *See—*
Jimerson, Bruce D.; and Nakasone, Henry H., 4,350,903, Cl. 307-252.00B.

Nakayama, Hiroshi: *See—*
Hamada, Isao; Nakayama, Hiroshi; Kawakami, Nobuyoshi; Azami, Hirotaka; Ikeda, Tadasu; Yukawa, Yasumasa; Mitani, Hiroshi; Ohmori, Takashi; Kimura, Masanobu; and Seno, Kohichi, 4,350,510, Cl. 55-349.000.

Nakayama, Shigeru; and Takizawa, Tastuo, to Olympus Optical Company Ltd. Temperature sensor for sheet-shaped heating element. 4,350,870, Cl. 219-216.000.

Nakazato, Koichi: *See—*
Akiyama, Masatoshi; Kitamura, Shigeki; Tetsu, Junichi; and Nakazato, Koichi, 4,350,514, Cl. 65-36.000.

Nakazato, Masao: *See—*
Sakata, Kazuhiro; Yuminaka, Takeo; Nakazato, Masao; Yoneda, Kenji; Kuzunuki, Soshiro; and Katayama, Yasunori, 4,350,225, Cl. 187-29.00R.

Natarajan, Ramamurthy: *See—*
Ingram, Brian; Harries, David A.; and Natarajan, Ramamurthy, 4,350,230, Cl. 188-79.000.

National Printing Plate Company, Inc.: *See—*
Fishburn, Charles E., 4,350,437, Cl. 355-52.000.

National Research Development Corporation: *See—*
Galfre, Giovanni; Milstein, Cesar; and Wright, Bruce W., 4,350,683, Cl. 424-85.000.
Greenough, George K.; and Brown, Richard C., 4,350,507, Cl. 55-270.000.

NCR Corporation: *See—*
Coleman, William E.; and Hall, Stacy W., 4,350,932, Cl. 315-169.200.

Nelson, Marvin D., to Honeywell Inc. Thermostat assembly. 4,350,966, Cl. 337-302.000.

Nelson, Merritt J.; and Nelson, Merritt S. Ball cock assembly. 4,350,178, Cl. 137-444.000.

Nelson, Merritt S.: *See—*
Nelson, Merritt J.; and Nelson, Merritt S., 4,350,178, Cl. 137-444.000.

Nelson, Richard E.; and Starr, Thomas J. Portable modular beverage dispenser. 4,350,267, Cl. 222-131.000.

Nelson, Roger J., to Deere & Company. Flow transducer. 4,350,050, Cl. 73-861.540.

New York City Transit Authority: *See—*
Bush, Charles J., 4,350,290, Cl. 238-17.000.

Newman, David H.: *See—*
Matthews, Michael R.; Newman, David H.; Smith, David R.; and Steventon, Alan G., 4,350,960, Cl. 372-46.000.

Newman, Stephen: *See—*
Stevens, John; and Newman, Stephen, 4,350,644, Cl. 260-501.150.

Neyret, Guy, to Sodex-Magister, Societe d'Exploitation des Brevets Neiman. Bi-stable mechanism and anti-theft device for a motor vehicle comprising such mechanism. 4,350,852, Cl. 200-42.00A.

Nezworski, James E., to Perlick Company, Inc., The. Portable keg tapping coupler with vent. 4,350,270, Cl. 222-336.000.

Nezworski, James E.; and Strobel, John M., to Perlick Company, Inc., The. Portable keg tapping coupler. 4,350,273, Cl. 222-400.800.

Nichols, Edward L., III: *See—*
Campbell, Paul K.; and Nichols, Edward L., III, 4,350,843, Cl. 174-94.00R.

Nicko, Reinhard: *See—*
Engelsmann, Dieter; Nicko, Reinhard; Bittner, Wilfried; and Karl, Horst, 4,350,423, Cl. 354-173.000.

Nicolas, Jean-Claude; Terouanne, Beatrice; Descomps, Bernard; and Crastes de Paulet, Andre, to Institut National de la Sante et de la Recherche Medicale. Method for the separation of a protein substance from a solution containing the same by affinity filtration and application of said method to enzymatic assays. 4,350,760, Cl. 435-7.000.

Nifco Inc.: *See—*
Tanaka, Toshie; and Yuda, Takuo, 4,349,993, Cl. 52-208.000.

Nilsson, Sten E.: *See—*
Parsson, Nils O.; and Nilsson, Sten E., 4,350,389, Cl. 297-410.000.

Nilssuns Industriemballage AB: *See—*
Persson, Nils G. W., 4,350,099, Cl. 108-56.100.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Fujita, Shinichi, 4,350,949, Cl. 323-284.000.
Suzuki, Hideo; and Kaneko, Makoto, 4,350,068, Cl. 84-1.010.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
Shimokawa, Wataru; Ito, Yoshiaki; Kobayashi, Koichi; Fukumori, Katuaki; and Iwase, Nobukazu, 4,350,788, Cl. 524-309.000.

Nippon Kayaku Kabushiki Kaisha: *See—*
Takei, Yukio; Yoshida, Masao; and Nishizawa, Rinzo, 4,350,813, Cl. 544-237.000.

Nippon Kogaku K. K.: *See—*
Takahashi, Yosuke; Akasaka, Hideki; Kasui, Toshikatsu; and Niwa, Tatsuo, 4,350,414, Cl. 350-357.000.

Nippon Kogaku K.K.: *See—*
Maida, Osamu, 4,350,422, Cl. 354-173.000.

Nippon Mining Co., Ltd.: *See*—
Hamada, Isao; Nakayama, Hiroshi; Kawakami, Nobuyoshi; Azami, Hirotaka; Ikeda, Tadasu; Yukawa, Yasumasa; Mitani, Hiroshi; Ohmori, Takashi; Kimura, Masanobu; and Seno, Kohichi, 4,350,510, Cl. 55-349.000.
Nippon Soken, Inc.: *See*—
Tanaka, Hiroaki; and Akita, Sigeyuki, 4,350,981, Cl. 340-870.370.
Yoshinaga, Toru; Igashira, Toshihiko; Mori, Kouichi; Kawai, Hisasi; and Morino, Seiji, 4,350,137, Cl. 123-617.000.
Nippon Steel Corporation: *See*—
Imai, Ichiro; Furuya, Takashi; Ando, Narumi; and Kitajima, Satoyuki, 4,350,538, Cl. 148-12.00D.
Nippon Telegraph & Telephone Public Corporation: *See*—
Kinoshita, Kyoichi; and Kobayashi, Morio, 4,350,867, Cl. 219-121.0LC.
Mizushima, Yoshihiko; Takeda, Akitsu; Yoshikawa, Akira; Ochi, Osamu; and Hisaki, Tomoko, 4,350,541, Cl. 148-188.000.
Nippon Zeon Co. Ltd.: *See*—
Oyama, Motofumi; and Hashimoto, Kinro, 4,350,796, Cl. 525-233.000.
Sugimura, Takaaki; Ozawa, Yutaka; and Takahashi, Mari, 4,350,723, Cl. 428-42.000.
Nishida, Yoshinori: *See*—
Takagi, Masaharu; and Nishida, Yoshinori, 4,350,868, Cl. 219-137.00R.
Nishikage, Tadao: *See*—
Hiyoshi, Kazuhiko; Matsuura, Norio; Matsugichi, Michiharu; Onofusa, Norio; and Nishikage, Tadao, 4,350,622, Cl. 524-831.000.
Nishikawa, Hideo, to Imanishi Flexible Tube Mfg. Co., Ltd. Hot air supply type electric oven. 4,350,874, Cl. 219-400.000.
Nishimura, Yoshiharu: *See*—
Uchimura, Mitsuo; Oana, Masao; and Nishimura, Yoshiharu, 4,351,033, Cl. 364-900.000.
Nishino, Atsushi; Kimura, Kunio; Sonetaka, Kazunori; and Takeuchi, Yasuhiro, to Matsushita Electric Industrial Company, Limited. Catalyst for purifying exhaust gases and method for manufacturing same. 4,350,613, Cl. 252-455.00R.
Nishino, Hiroshi: *See*—
Matsuda, Akira; Havakawa, Yoshihiro; Yasuda, Shigeo; Iwasaki, Motoaki; and Nishino, Hiroshi, 4,350,854, Cl. 200-61.250.
Nishizawa, Rinzo: *See*—
Takei, Yukio; Yoshida, Masao; and Nishizawa, Rinzo, 4,350,813, Cl. 544-237.000.
Niskin, Shale J. Light saver device. 4,350,931, Cl. 315-72.000.
Nissan Motor Company, Limited: *See*—
Higashiyama, Kazuhiro, 4,351,050, Cl. 371-12.000.
Izumi, Masao, 4,350,025, Cl. 62-285.000.
Kikuta, Masaaki, 4,350,383, Cl. 296-72.000.
Kishi, Norimasa; and Suzuki, Tadashi, 4,350,057, Cl. 74-866.000.
Kogawa, Kouichi; Kawasaki, Teruo; and Nomura, Hiroyuki, 4,350,901, Cl. 307-10.00R.
Matsuno, Yoshio, 4,350,544, Cl. 156-79.000.
Nakajima, Yasuo; Hayashi, Yoshimasa; Nagumo, Shin-ichi; and Yoshimura, Tooru, 4,350,129, Cl. 123-440.000.
Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, 4,350,289, Cl. 237-12.30A.
Suga, Masaaki; and Hamada, Hideo, 4,350,234, Cl. 192-4.00A.
Takei, Hirofumi, 4,350,223, Cl. 181-229.000.
Yasuda, Akira, 4,350,384, Cl. 296-146.000.
Yoshiba, Yasutaka, 4,350,013, Cl. 60-605.000.
Nissin Kogyo Kabushiki Kaisha: *See*—
Takeuchi, Hiroo, 4,350,077, Cl. 91-376.00R.
Niwa, Tatsuo: *See*—
Takahashi, Yosuke; Akasaka, Hideki; Kasui, Toshikatsu; and Niwa, Tatsuo, 4,350,414, Cl. 350-357.000.
NL Industries Inc.: *See*—
Radtke, Robert P., 4,350,215, Cl. 175-329.000.
Nobis, Rolf, to Heinrich-Hertz-Institut fur Nachrichtentechnik Berlin GmbH. Circuit arrangement for user stations in a communications network. 4,351,049, Cl. 370-62.000.
Noble, Glendle W.: *See*—
Dowgul, Ronald W.; and Noble, Glendle W., 4,350,662, Cl. 422-122.000.
Noda, Atsushi, to Canon Kabushiki Kaisha. Printer provided with a margin setting mechanism. 4,350,456, Cl. 400-344.000.
Noda, Atsushi: *See*—
Hanagata, Takayoshi; and Noda, Atsushi, 4,350,448, Cl. 400-120.000.
Hanagata, Takayoshi; and Noda, Atsushi, 4,350,987, Cl. 346-76.0PH.
Nolf, Jean-Marie E., to N.V. Raychem S.A. Cable sleeve outlet for splice case. 4,350,842, Cl. 174-92.000.
Noltac Corp.: *See*—
Slavin, James A., 4,350,429, Cl. 354-299.000.
Noly, Jean, to Potain. Container handling and lifting equipment, such as a crane or a gantry. 4,350,254, Cl. 212-153.000.
Noma, Jun: *See*—
Masuko, Tatsuo; Fukaya, Shigeo; Murai, Nobuyuki; and Noma, Jun, 4,350,829, Cl. 562-531.000.
Nomura, Hiroyuki: *See*—
Kogawa, Kouichi; Kawasaki, Teruo; and Nomura, Hiroyuki, 4,350,901, Cl. 307-10.00R.
Nord-Micro Elektronik Feinmechanik AG: *See*—
Waldmann, Dieter; and Ohnesorge, Bernd, 4,350,950, Cl. 324-78.00D.
Norddeutsche Faserwerke GmbH: *See*—
Pfluger, Helmut C., 4,350,725, Cl. 428-95.000.
Norden, Alexander R., to Federal Pacific Electric Company. Multipole circuit breakers. 4,350,965, Cl. 337-47.000.
Nordson Corporation: *See*—
Rood, Alvin A., 4,349,947, Cl. 29-157.00C.
North American Philips Corporation: *See*—
Baum, Karl F., 4,350,784, Cl. 524-759.000.
Northern Telecom Limited: *See*—
Busche, Alan C.; and Simonsen, Karlo B., 4,350,846, Cl. 179-1.00C.
Norton Company: *See*—
Zimmer, William F., 4,350,498, Cl. 51-298.000.
Nose, Yukihiko: *See*—
Malchesky, Paul S.; and Nose, Yukihiko, 4,350,156, Cl. 128-214.00R.
Novak, Peter: *See*—
Gasser, Hermann; Curiger, Karl; and Novak, Peter, 4,350,007, Cl. 57-304.000.
Nukushina, Yasuhiko: *See*—
Okamoto, Miyoshi; Watanabe, Koji; Nukushina, Yasuhiko; and Aizawa, Tsuneo, 4,350,006, Cl. 57-250.000.
Nury, Georges: *See*—
Boudot, Bernard; and Nury, Georges, 4,350,558, Cl. 156-617.0SP.
Boudot, Bernard; and Nury, Georges, 4,350,559, Cl. 156-617.0SP.
Nusco Kabushiki Kaisha: *See*—
Hayashi, Shigeki; and Kusakabe, Mitsuo, 4,350,065, Cl. 83-287.000.
N.V. Raychem S.A.: *See*—
Nolf, Jean-Marie E., 4,350,842, Cl. 174-92.000.
Oana, Masao: *See*—
Uchimura, Mitsuo; Oana, Masao; and Nishimura, Yoshiharu, 4,351,033, Cl. 364-900.000.
Ochi, Osamu: *See*—
Mizushima, Yoshihiko; Takeda, Akitsu; Yoshikawa, Akira; Ochi, Osamu; and Hisaki, Tomoko, 4,350,541, Cl. 148-188.000.
O'Connor, John W., to Allis-Chalmers Corporation. Hydraulic draft control valve. 4,350,209, Cl. 172-7.000.
Odin, Eugene: *See*—
Demler, Walter R.; and Odin, Eugene, 4,350,827, Cl. 562-475.000.
Off, Joseph W. A., to Haggar Company. Pocket construction. 4,349,920, Cl. 2-247.000.
Ogata, Masaru; and Matsumoto, Hiroshi, to Shionogi & Co., Ltd. N(2-Pyrrolidinylmethyl)meta-sulfonamido-benzamides. 4,350,635, Cl. 260-326.470.
Ogawa, Hiroshi, to Mitsui Petrochemical Industries, Ltd. Seat. 4,350,390, Cl. 297-452.000.
Ogawa, Masahiko: *See*—
Taguchi, Tetsuya; Tamura, Shuichi; Tokuda, Ryuji; and Ogawa, Masahiko, 4,350,418, Cl. 354-25.000.
Ogawa, Tsutomu: *See*—
Nakano, Motoo; and Ogawa, Tsutomu, 4,350,536, Cl. 148-1.500.
Ogihara, Masuo; Chimura, Kozo; and Shinozaki, Nobuo, to Seiko Koki Kabushiki Kaisha. Time detecting switch for an alarm clock. 4,351,043, Cl. 368-252.000.
Ogman, Abraham. Reinforced grinding device. 4,350,497, Cl. 51-296.000.
Ohashi, Toshio: *See*—
Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, 4,350,289, Cl. 237-12.30A.
Ohmori, Takashi: *See*—
Hamada, Isao; Nakayama, Hiroshi; Kawakami, Nobuyoshi; Azami, Hirotaka; Ikeda, Tadasu; Yukawa, Yasumasa; Mitani, Hiroshi; Ohmori, Takashi; Kimura, Masanobu; and Seno, Kohichi, 4,350,510, Cl. 55-349.000.
Ohnesorge, Bernd: *See*—
Waldmann, Dieter; and Ohnesorge, Bernd, 4,350,950, Cl. 324-78.00D.
Ohnmacht, Helmut: *See*—
Meywald, Klaus; and Ohnmacht, Helmut, 4,350,872, Cl. 219-376.000.
Ohnuma, Teruyuki; Miyakawa, Seiichi; and Oyama, Hajime, to Ricoh Company Ltd. Reverse development method. 4,350,749, Cl. 430-100.000.
Ohtsuki, Tomonari: *See*—
Kato, Matsuo; Ohtsuki, Tomonari; Igarashi, Yoshiaki; Saito, Tsukasa; and Suzuki, Toshiaki, 4,350,409, Cl. 339-186.00M.
Oil Dynamics, Inc.: *See*—
Wilson, Brown L.; and Carle, Joseph T., 4,350,911, Cl. 310-87.000.
Okada, Takao: *See*—
Uenosono, Chikasa; Okada, Takao; Matsuki, Junya; Naito, Tadashi; Inoue, Shinichiro; and Takahashi, Masaki, 4,350,947, Cl. 322-17.000.
Okamoto, Miyoshi; Watanabe, Koji; Nukushina, Yasuhiko; and Aizawa, Tsuneo, to Toray Industries, Inc. Synthetic filaments and the like. 4,350,006, Cl. 57-250.000.
Okawa, Takashi: *See*—
Isogai, Nobuo; Okawa, Takashi; Hosokawa, Motoyuki; Watanabe, Toshiyasu; and Wakui, Natsuko, 4,350,668, Cl. 423-139.000.
Okuno, Ryuzo: *See*—
Fujii, Hiroo; Tanaka, Kiyoaki; Nakamura, Masashi; Okuno, Ryuzo; Hashizume, Shigeyuki; Katayama, Hideo; and Fujita, Tsutomu, 4,350,326, Cl. 266-201.000.
Olbrich, Gottfried; and Pfeffer, Peter, to Robert Bosch GmbH. Battery powered electric motor vehicle. 4,350,219, Cl. 180-65.00R.
Oldaker, Herman F.: *See*—
Dowler, Danny E.; and Oldaker, Herman F., 4,349,995, Cl. 52-241.000.

Oldershaw, Paul V.; Hansen, James E.; and Hinds, Walter E. Bottom hole oil well pump. 4,350,478, Cl. 417-417.000.
Olds, Leonard E., to Manville Service Corporation. Optimized mixing and melting electric furnace. 4,351,054, Cl. 373-38.000.
Olin Corporation: *See—*
Kadija, Igor V., 4,350,580, Cl. 204-279.000.
Olofsson, Bertil R., to Akermans Verkstad AB. Apparatus for restricting the velocity of a hydraulic piston in its end positions. 4,350,078, Cl. 91-388.000.
Olson, Gerald R. Two-sided magnetized diverting plate for hammermill. 4,350,307, Cl. 241-81.000.
Olsson, Jan G.; and Samuelsson, Lars E. Assembly of prefabricated bicycle components. 4,350,360, Cl. 280-279.000.
Olsson, Sven O. Paddle. 4,350,445, Cl. 366-343.000.
Olympic Power Winches Limited: *See—*
Tattersall, John C., 4,350,109, Cl. 114-105.000.
Olympus Optical Co., Ltd.: *See—*
Kubota, Tetsumaru; and Koyata, Kenji, 4,350,150, Cl. 128-6.000.
Nakayama, Shigeru; and Takizawa, Tastuo, 4,350,870, Cl. 219-216.000.
Osada, Hajime; Kimura, Akiteru; Shimizu, Tokuo; Kitajima, Goro; Tomizawa, Yoshio; Kondo, Makoto; Motoyama, Kazuyasu; and Daigaku, Masaaki, 4,351,009, Cl. 360-105.000.
Yamashita, Nobuo; and Maeda, Miwako, 4,350,149, Cl. 128-6.000.
Omi, Kyoji: *See—*
Suzuki, Shigeru; Suzuki, Minoru; Suzuki, Koichi; Omi, Kyoji; Nagahara, Yasumori; Kagari, Yoshiharu; Hashimoto, Makoto; and Mori, Goro, 4,350,750, Cl. 430-125.000.
Ono, Toshihiko: *See—*
Kawai, Syuji; Yamane, Tadayuki; Abe, Michio; Ono, Toshihiko; and Yamauchi, Shuji, 4,350,594, Cl. 210-637.000.
Onofusa, Norio: *See—*
Hiyoshi, Kazuhiko; Matsuura, Norio; Matsugichi, Michiharu; Onofusa, Norio; and Nishikage, Tadao, 4,350,622, Cl. 524-831.000.
Opitz, Heinrich: *See—*
Montag, Bernhard; Mages, Gert; and Opitz, Heinrich, 4,350,757, Cl. 430-422.000.
Opprecht, Paul: *See—*
Stieger, Othmar, 4,350,862, Cl. 219-64.000.
Optimetrix Corporation: *See—*
Phillips, Edward H., 4,350,428, Cl. 354-254.000.
Osada, Hajime; Kimura, Akiteru; Shimizu, Tokuo; Kitajima, Goro; Tomizawa, Yoshio; Kondo, Makoto; Motoyama, Kazuyasu; and Daigaku, Masaaki, to Olympus Optical Co., Ltd. Apparatus for moving the pinch roller and the magnetic head of a tape recorder. 4,351,009, Cl. 360-105.000.
Ostler, Earl W., to Agri-Systems. Automatic feeding apparatus. 4,350,118, Cl. 119-51.00R.
Ostler, Earl W., to Agri-Systems. Animal feeding apparatus. 4,350,119, Cl. 119-51.00R.
Ostrowski, John S.; Grunewalder, John F.; and Castellucci, Nicholas T., to PPG Industries, Inc. Curable compositions comprising an azole-functional resin and a metal-ligand complex. 4,350,804, Cl. 525-327.300.
Otis Elevator Company: *See—*
Sheehy, George E.; and Bittar, Joseph, 4,350,226, Cl. 187-29.00R.
Otka, Robert P.: *See—*
Holt, James L.; and Otka, Robert P., 4,350,952, Cl. 324-166.000.
Ottertun, Harald D.: *See—*
Andersson, Sven O. S.; Ottertun, Harald D.; and Reinhardt, Hans, 4,350,667, Cl. 423-24.000.
Otto Durr Anlagenbau GmbH: *See—*
Otto, Eberhard, 4,350,506, Cl. 55-241.000.
Otto, Eberhard, to Otto Durr Anlagenbau GmbH. Washing device. 4,350,506, Cl. 55-241.000.
Ouchi, Hidenaga: *See—*
Itagaki, Takaharu; and Ouchi, Hidenaga, 4,350,773, Cl. 521-31.000.
Outboard Marine Corporation: *See—*
Holt, James L.; and Otka, Robert P., 4,350,952, Cl. 324-166.000.
Ovcharenko, Nikolai T.: *See—*
Pokhodnya, Igor K.; Shlepakov, Valery N.; Alter, Vladimir F.; Ovcharenko, Nikolai T.; Kaplienko, Igor P.; and Rak, Petr I., 4,350,311, Cl. 242-83.000.
Owens-Illinois, Inc.: *See—*
McColl, Bruce J., 4,350,190, Cl. 144-3.00D.
Owsley, Herbert B.: *See—*
Bunn, Stuart E.; and Owsley, Herbert B., 4,350,179, Cl. 137-540.000.
Oyama, Hajime: *See—*
Ohnuma, Teruyuki; Miyakawa, Seiichi; and Oyama, Hajime, 4,350,749, Cl. 430-100.000.
Oyama, Motofumi; and Hashimoto, Kinro, to Nippon Zeon Co. Ltd. Oil-resistant rubber composition. 4,350,796, Cl. 525-233.000.
Oyokota, Shigeru: *See—*
Ueda, Hiroshi; and Oyokota, Shigeru, 4,350,421, Cl. 354-152.000.
Ozawa, Yutaka: *See—*
Sugimura, Takaaki; Ozawa, Yutaka; and Takahashi, Mari, 4,350,723, Cl. 428-42.000.
Ozols, Gunars M.: *See—*
Frieser, Rudolf G.; Ma, William H.; Ozols, Gunars M.; and Zingerman, Bryant N., 4,350,578, Cl. 204-192.00R.
P.I.V. Antrieb Werner Reimers GmbH & Co. KG: *See—*
Steuer, Herbert, 4,350,491, Cl. 474-12.000.
Pabodie, Robert M., to Monarch Marking Systems, Inc. Label printing and applying apparatus. 4,350,554, Cl. 156-384.000.
Pabst, Manfred: *See—*
Van Wersch, Kurt; and Pabst, Manfred, 4,349,930, Cl. 8-151.000.
Pacific Scientific Company: *See—*
Yang, Elmer C., 4,350,232, Cl. 188-378.000.
Package Machinery Company: *See—*
Greenawalt, Eddie L.; Ray, Steve C.; and Garner, Daniels S., 4,350,003, Cl. 53-548.000.
Page, Edward H.: *See—*
Scotti, Frank; and Page, Edward H., 4,350,774, Cl. 521-95.000.
Page, John S., Jr. Apparatus to pump multiple wells. 4,350,080, Cl. 91-520.000.
Paget, Win W.: *See—*
Meece, Meredith W.; and Paget, Win W., 4,350,475, Cl. 417-238.000.
Pagnamenta, Antonio, to Motorola, Inc. Impedance matching circuitry for radio frequency signal power amplifiers. 4,350,958, Cl. 330-286.000.
Pako Corporation: *See—*
Anderson, Richard D.; and Wedel, John A., 4,350,277, Cl. 226-190.000.
Palvarini, Attilio; Lorusso, Simone; and Longoni, Angelo, to Montedison S.p.A. Pesticide-containing plastic coverings for agricultural cultivations. 4,350,678, Cl. 424-27.000.
Pander, Hans J.: *See—*
Degner, Dieter; Pander, Hans J.; and Siegel, Hardo, 4,350,641, Cl. 260-465.00E.
Pandrol Limited: *See—*
Dobson, George D., 4,350,291, Cl. 238-349.000.
Pankratova, Lidia A.: *See—*
Alexandrov, Vyacheslav S.; Guschin, Alexandr E.; Zavodov, Rudolf V.; Zhukova, Elena I.; Ivanov, Alexandr A.; Fofanova, Tatyana S.; Mikhailov, Evgeny I.; Dianov, Ivan M.; Luzin, Pavel M.; Sergeev, Igor A.; Pankratova, Lidia A.; Krylova, Vera E.; and Leibenzon, Semen A., 4,350,482, Cl. 425-83.100.
Panlmatic Company: *See—*
Rusteberg, Robert K., 4,350,253, Cl. 211-74.000.
Paradis, Roland C.: *See—*
Conlon, Ralph D.; Miles, Stanley F.; and Paradis, Roland C., 4,350,586, Cl. 210-149.000.
Pardon, Pierre; Lantier, Frederic; Marly, Jose; and Bourgy, Gerard, to Institut National de la Recherche Agronomique. Preparation of *Salmonella abortus ovis* strains and vaccine compositions containing them. 4,350,684, Cl. 424-92.000.
Parfree, Colin S.; and Worthington, Peter, to International Standard Electric Corporation. Cable strain monitoring. 4,350,046, Cl. 73-768.000.
Parikh, Shridhar V.: *See—*
Goswami, Jagadish C.; and Parikh, Shridhar V., 4,350,792, Cl. 525-129.000.
Parker, Richard G., to B. F. Goodrich Company, The. Chlorination of poly(vinyl chloride) in liquid chlorine, and chlorinated poly(vinyl chloride) composition. 4,350,798, Cl. 525-331.600.
Parma Corporation: *See—*
Rogers, Walter C., Jr., 4,350,386, Cl. 297-85.000.
Rogers, Walter C., Jr., 4,350,387, Cl. 297-85.000.
Parsen, Frank E.; and Yatabe, Thomas T., to Duracell Inc. Electrochemical cells having hydrogen gas absorbing agent. 4,350,745, Cl. 429-57.000.
Parsson, Nils O.; and Nilsson, Sten E., to Saab-Scania Aktiebolag. Safety headrest for a vehicle seat. 4,350,389, Cl. 297-410.000.
Pasbrig, Max, to Lacrex Brevetti S.A. Appliance for use in finger exercises. 4,350,335, Cl. 272-67.000.
Pascoe, Robert A.: *See—*
Moore, Daniel J.; and Pascoe, Robert A., 4,350,455, Cl. 400-279.000.
Pasternack, Adalbert, to Dragerwerk AG. Warning signal device for respirators. 4,350,115, Cl. 116-70.000.
Patel, Raman: *See—*
Coran, Aubert Y.; and Patel, Raman, 4,350,740, Cl. 428-461.000.
Patentes Y Novedades, S.A.: *See—*
Bruguera, Ramon, 4,350,543, Cl. 156-62.800.
Patis, Bruce L., to Illinois Tool Works Inc. Battery hydrometer with analog output. 4,350,885, Cl. 250-231.00R.
Paulus, Rudolf; Schankat, Norbert; Weinzierl, Manfred; and Franke, Walter, to Agfa-Gevaert Aktiengesellschaft. Electrophotographic copying machine. 4,350,434, Cl. 355-14.0SH.
Payette, Lionel J.: *See—*
Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., 4,350,737, Cl. 428-383.000.
Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., 4,350,738, Cl. 428-383.000.
Peddie, Robert A.; and Fielden, John S., to South Eastern Electricity Board. Meters for measuring electrical energy consumption. 4,351,028, Cl. 364-483.000.
Peelman, Harold E., to Halliburton Company. Method and system for determining thermal neutron lifetime of earth formations. 4,350,888, Cl. 250-270.000.
Peil, William; and McFadyen, Robert J., to General Electric Company. Lighting unit. 4,350,930, Cl. 315-49.000.
Pendleton, Harlan C. Removable chisel blade. 4,349,961, Cl. 30-168.000.
Penick, Ib; and Volkert, John K., to Compak Systems, Inc. Pop-ups and methods of making. 4,349,973, Cl. 40-124.100.
Penn, Laurence R., to Liquid Control Incorporated. Reaction arrestment mixer head and mixing process. 4,350,803, Cl. 528-10.000.

Pennwalt Corporation: *See*—
Vidal, Frederick D.; and Jayaraman, Anantharaman, 4,350,709, Cl. 426-319.000.
Wuerflein, Don E., 4,350,891, Cl. 378-110.000.
Peplow, Marvin J.: *See*—
Isham, Leonard E.; Peplow, Marvin J.; Sandy, Julius W.; and ViPond, Clyde M., 4,350,061, Cl. 81-9.510.
Perepezko, John H.; and Wiley, John D., to Wisconsin Alumni Research Foundation. Semiconductor device having an amorphous metal layer contact. 4,350,994, Cl. 357-67.000.
Perfluktiv-Consult AG: *See*—
Sundermann, Erich, 4,350,710. Cl. 426-19.000.
Perkin-Elmer Corporation, The: *See*—
Conlon, Ralph D.; Miles, Stanley F.; and Paradis, Roland C., 4,350,586, Cl. 210-149.000.
Perkin-Elmer Limited: *See*—
Higham, Peter, 4,350,037, Cl. 73-23.000.
Perlick Company, Inc., The: *See*—
Nezworski, James E., 4,350,270, Cl. 222-336.000.
Nezworski, James E.; and Strobel, John M., 4,350,273, Cl. 222-400.800.
Pernot, Jean-Michel: *See*—
Decraemer, Alain; and Pernot, Jean-Michel, 4,351,002, Cl. 358-158.000.
Peroutky, Donald C., to General Electric Company. Universal lifting magnet. 4,350,379, Cl. 294-65.500.
Perry, Fred G., to General Electric Company. Multiple console control system. 4,350,972, Cl. 340-825.000.
Perseo, Giuseppe: *See*—
de Castiglione, Roberto; Faoro, Fiorenzo; Perseo, Giuseppe; Piani, Silvano; and Santangelo, Francesco, 4,350,627, Cl. 260-112.50E.
Persson, Christer: *See*—
Rosengren, Bengt; and Persson, Christer, 4,350,146, Cl. 126-447.000.
Persson, Lennart P. E.: *See*—
Hakansson, Hakan B.; Persson, Lennart P. E.; and Wall, Berth-Ove G., 4,349,958, Cl. 29-612.000.
Persson, Nils G. W., to Nilssuns Industriemballage AB. Cargo pallet. 4,350,099, Cl. 108-56.100.
Peters, Carl H., to Platmanufaktur AB. Composite packing. 4,350,250, Cl. 206-605.000.
Peterson, Francis C., to Illinois Tool Works Inc. Rotary cutting wheel and method of making. 4,349,963, Cl. 30-347.000.
Peterson/Puritan, Inc.: *See*—
Hughett, Paul D., 4,350,605, Cl. 252-305.000.
Peterson, Richard H. Hybrid pipe organ with electronic tonal augmentation. 4,350,073, Cl. 84-1.250.
Petryk, Edward M., Jr., to Honeywell Information Systems Inc. Receiver apparatus for converting optically encoded binary data to electrical signals. 4,350,973, Cl. 340-347.0DD.
Petterson, Tor H. Product isolated aerosol container and method of manufacture. 4,350,272, Cl. 222-386.500.
Petty, Walter L., to Shell Oil Company. Process for preparation of a pesticidal phenylacetate enantiomer pair. 4,350,642, Cl. 260-465.00D.
Petzolt, Gert: *See*—
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,349,948, Cl. 29-157.10R.
Pfaff Industriemaschinen GmbH: *See*—
Albrecht, Ernst; Hensel, Reiner; Keller, Karl-Heinz; and Stahlschmitt, Horst, 4,350,105, Cl. 112-256.000.
Pfeffer, Peter: *See*—
Olbrich, Gottfried; and Pfeffer, Peter, 4,350,219, Cl. 180-65.00R.
Pfizer Inc.: *See*—
Cross, Peter E.; and Dickinson, Roger P., 4,350,696, Cl. 424-251.000.
Pfluger, Helmut C., to Norddeutsche Faserwerke GmbH. Fabric and garment of circular weft-knit or circular warp-knit material. 4,350,725, Cl. 428-95.000.
Philip, Charles R. Motorized fishing apparatus. 4,349,978, Cl. 43-19.200.
Philip Morris, Incorporated: *See*—
Van Auken, Thomas V., 4,350,832, Cl. 564-123.000.
Philipp, Rainer: *See*—
Heinemann, Otto; Schmits, Heinz-Herbert; Philipp, Rainer; and Berger, Artur, 4,350,244, Cl. 198-773.000.
Phillips, Edward H., to Optimetrix Corporation. Shutter mechanism. 4,350,428, Cl. 354-254.000.
Phillips Petroleum Company: *See*—
Blackwell, Jennings P.; and Towers, Richard R., 4,350,786, Cl. 524-263.000.
Furr, Danny L., 4,350,569, Cl. 203-2.000.
Tieszen, Dale O.; and Scoggins, Lacey E., 4,350,810, Cl. 528-388.000.
Phillips, Robert B., to Australasian Training Aids, Pty., Ltd. Hit detection and richochet discrimination in target apparatus. 4,350,882, Cl. 235-400.000.
Phillips, Robert B., to Australasian Training Aids (Pty.) Limited. Projectile locating apparatus for use in target shooting. 4,351,026, Cl. 364-423.000.
Phillips, Robert B.: *See*—
Knight, Lindsay C.; Phillips, Robert B.; Bowyer, William H.; and Moxley, Bruce, 4,350,881, Cl. 235-400.000.
Piani, Silvano: *See*—
de Castiglione, Roberto; Faoro, Fiorenzo; Perseo, Giuseppe; Piani, Silvano; and Santangelo, Francesco, 4,350,627, Cl. 260-112.50E.
Picard, George E. Chain saw support apparatus. 4,350,067, Cl. 83-796.000.
Pierce Corporation: *See*—
Gheen, Lyndle G., 4,350,295, Cl. 239-178.000.
Pike, Roscoe A.: *See*—
Layden, George K., Jr.; Bourdeau, Romeo G.; and Pike, Roscoe A., 4,350,672, Cl. 423-445.000.
Pilkington P.E. Limited: *See*—
Rogers, Philip J., 4,350,411, Cl. 350-174.000.
Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See*—
Murahara, Koichi; and Yasunaga, Teibun, 4,350,458, Cl. 401-145.000.
Pilwat, Gunter: *See*—
Zimmermann, Ulrich; Saleemuddin, Mohammed; and Pilwat, Gunter, 4,350,767, Cl. 435-183.000.
Pino, Isidro. Quick closing gate. 4,350,199, Cl. 160-201.000.
Pinomaki, Sakari. Lever operated control apparatus. 4,350,055, Cl. 74-471.0XY.
Pintenat, Andre M.: *See*—
Cannavo, Christian G.; Cousin, Georges; Espagnacq, Andre; Frayssac, Jacques X.; Laine, Loic Y.; Midrouillet, Daniel J.; Pintenat, Andre M.; and Reboux, Jean B., 4,350,096, Cl. 102-209.000.
Platmanufaktur AB: *See*—
Peters, Carl H., 4,350,250, Cl. 206-605.000.
Platt, Thomas E.: *See*—
Fitzgerald, Maurice J.; and Platt, Thomas E., 4,350,759, Cl. 430-630.000.
Platz, Rolf: *See*—
Rieber, Norbert; Bohm, Heinrich; Platz, Rolf; and Fuchs, Werner, 4,350,819, Cl. 548-375.000.
Plum, Helmut: *See*—
Fischer, Hannes; and Plum, Helmut, 4,350,809, Cl. 528-361.000.
Pneumatic Scale Corporation: *See*—
Trusselle, William H.; and Gustafson, John A., Jr., 4,350,187, Cl. 141-90.000.
Pochet, Roger: *See*—
Yapoudjian, Claude; and Pochet, Roger, 4,350,405, Cl. 339-97.00P.
Pokhodnya, Igor K.; Shlepakov, Valery N.; Alter, Vladimir F.; Ovcharenko, Nikolai T.; Kaplienko, Igor P.; and Rak, Petr I. Wire coiling machine. 4,350,311, Cl. 242-83.000.
Polaroid Corporation: *See*—
Bartels-Keith, James R.; and Puttick, Anthony J., 4,350,754, Cl. 430-219.000.
Fitzgerald, Maurice J.; and Platt, Thomas E., 4,350,759, Cl. 430-630.000.
Grasshoff, Michael J., 4,350,801, Cl. 526-93.000.
Polk Audio, Inc.: *See*—
Polk, Matthew S., 4,350,847, Cl. 179-1.0GA.
Polk, Matthew S., to Polk Audio, Inc. Subwoofer system using a passive radiator. 4,350,847, Cl. 179-1.0GA.
Poll, Ian, to Shell Oil Company. Method and apparatus for the combustion of solid fuel. 4,350,103, Cl. 110-264.000.
Pollin, Irvin, to United States of America, Army. Device to de-spin objects with very high spin. 4,350,315, Cl. 244-3.230.
Polster, Rudolf: *See*—
Fechner, Wolf D.; Kranz, Joachim; and Polster, Rudolf, 4,350,534, Cl. 106-288.00Q.
Polychrome Corporation: *See*—
Shelnut, James; Golda, Eugene; Wilkes, Alan; and Shimazu, Kenichi, 4,350,753, Cl. 430-190.000.
Pommer, Ernst-Heinrich: *See*—
Rentzea, Costin; Zeeh, Bernd; Pommer, Ernst-Heinrich; and Mappes, Celia J., 4,350,701, Cl. 424-269.000.
Pommerrenig, Dieter H., to Rockwell International Corporation. Multi-element imager device. 4,350,886, Cl. 250-239.000.
Popoff, Andrew, to Keuffel & Esser Company. Precision laminating press. 4,350,555, Cl. 156-540.000.
Poppe, Richard L.: *See*—
Childress, David L.; Hayes, William V.; and Poppe, Richard L., 4,350,830, Cl. 562-535.000.
Porta, Augusto; Fresnel, Jean-Marie; and Kulhanek, Antonin, to Battelle Memorial Institute. Method for preparing an aqueous treatment solution containing at least hydrogen peroxide ions and hydroxyl ions in predetermined concentrations. 4,350,575, Cl. 204-84.000.
Porter, Ned A.; Ziegler, Carl B., Jr.; and Roberts, David H., to Duke University. Vinyl cyclopropyl compounds as precursors to fatty acid oxidation products. 4,350,834, Cl. 568-568.000.
Post, Martin F. M.; and Schaper, Lambert, to Shell Oil Company. Process for the preparation of hydrocarbons from synthesis gas. 4,350,772, Cl. 518-714.000.
Post Office, The: *See*—
Matthews, Michael R.; Newman, David H.; Smith, David R.; and Steventon, Alan G., 4,350,960, Cl. 372-46.000.
Potain: *See*—
Noly, Jean, 4,350,254, Cl. 212-153.000.
Potter, Charles, to Go-Jo Industries, Inc. Manually operated dispensing pump. 4,350,268, Cl. 222-214.000.
Potter, R. Christopher: *See*—
Liska, Donald J.; Schamaun, Roger G.; Clark, Donald C.; Potter, R. Christopher; and Frank, Joseph A., 4,350,921, Cl. 313-360.100.
Potvin, Robert: *See*—
Moreau, Roland; and Potvin, Robert, 4,350,113, Cl. 114-270.000.
Pouillange, Jean P.; Gaydon, Jean P.; and Chausse, Bernard, to Compagnie Electro-Mecanique. Apparatus for heating strip elements in a

continuous pass process by electromagnetic induction. 4,350,861, Cl. 219-10.61R.

Power Controls Corporation: *See—*
Strauch, George E., Jr., 4,350,944, Cl. 318-779.000.

PPG Industries, Inc.: *See—*
Krumwiede, John F., 4,350,512, Cl. 65-27.000.
Ostrowski, John S.; Grunewalder, John F.; and Castellucci, Nicholas T., 4,350,804, Cl. 525-327.300.
Stewart, John L., 4,350,515, Cl. 65-40.000.

Presto Lock, Inc.: *See—*
Bako, Lazlo, 4,350,375, Cl. 292-24.000.

Priesnitz, Uwe: *See—*
Fuchs, Rainer; Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, 4,350,640, Cl. 260-465.00D.
Riebel, Hans-Jochem; Maurer, Fritz; and Priesnitz, Uwe, 4,350,824, Cl. 560-124.000.

Prinsze, Onno M. Multiple constant current battery charging apparatus. 4,350,946, Cl. 320-22.000.

Pritchard, Eric K. Amplifier for inductive loads with corrective current sensing. 4,350,943, Cl. 318-696.000.

Procter & Gamble Company, The: *See—*
Dornbusch, Arthur H.; and Smith, Raymond D., 4,350,281, Cl. 229-38.000.

Prudhon, Francois; and Scicluna, Augustin, to Rhone-Poulenc Industries. Device for treating substances in different phases, such as the treatment of substances in liquid, semi-liquid or paste form, by another notably gaseous phase. 4,350,101, Cl. 110-238.000.

Prueher, Andrew B. Lid for drinking containers. 4,350,260, Cl. 220-254.000.

PSI Mobile Products, Inc.: *See—*
Landers, Donald F., 4,350,362, Cl. 280-478.00A.

Purdue Research Foundation: *See—*
Mehlberg, Robert L., 4,350,766, Cl. 435-161.000.

Puttick, Anthony J.: *See—*
Bartels-Keith, James R.; and Puttick, Anthony J., 4,350,754, Cl. 430-219.000.

Quadco Alaska, Inc.: *See—*
Decker, Elmer L.; and Moon, James, 4,349,952, Cl. 29-402.060.

Quaker Oats Company, The: *See—*
Duvall, Leroy F., 4,350,714, Cl. 426-559.000.

Quintilian, Bartholomew F. Automatic fuel-cost monitoring system. 4,350,880, Cl. 235-96.000.

Quinton, Brian M., to De La Rue Giori S.A. Conveyor device for transferring sheets between two printing units of a combined printing machine. 4,350,334, Cl. 271-274.000.

Quist, Kaj, to AB Tudor. Liquid replenishment system for accumulator cells. 4,350,185, Cl. 141-35.000.

Radio Research Laboratories, Ministry of Posts and Telecommunications: *See—*
Yoshiya, Kiyosumi, 4,351,062, Cl. 375-99.000.

Radtke, Robert P., to NL Industries Inc. Drill bit and method of manufacture. 4,350,215, Cl. 175-329.000.

Rak, Petr I.: *See—*
Pokhodnya, Igor K.; Shlepakov, Valery N.; Alter, Vladimir F.; Ovcharenko, Nikolai T.; Kaplienko, Igor P.; and Rak, Petr I., 4,350,311, Cl. 242-83.000.

Ramirez, Justo D. Juicer having improved balance. 4,350,087, Cl. 99-511.000.

Randklev, Ronald M., to Minnesota Mining and Manufacturing Company. Glass composition and articles. 4,350,532, Cl. 106-30.000.

Ransburg Corporation: *See—*
Scharfenberger, James A., 4,350,720, Cl. 427-401.000.

Rapagnani, Nazareno L.: *See—*
Davis, Steven J.; and Rapagnani, Nazareno L., 4,350,661, Cl. 422-98.000.

Rapayelian, Christian, to Societe Brio, Societe Anonyme. Assembly for mounting a picture to be displayed. 4,349,974, Cl. 40-156.000.

Rasshofer, Werner; Grogler, Gerhard; and Meyborg, Holger, to Bayer Aktiengesellschaft. Process for the preparation of polymer precursors containing oxazolin-2-one rings. 4,350,781, Cl. 521-149.000.

Rault, Philippe M.: *See—*
Chable, Yves A.; Lacroix, Serge; and Rault, Philippe M., 4,350,168, Cl. 128-736.000.

Ray, Steve C.: *See—*
Greenawalt, Eddie L.; Ray, Steve C.; and Garner, Daniels S., 4,350,003, Cl. 53-548.000.

Raychem Corporation: *See—*
Holmes, James C., 4,350,183, Cl. 138-89.000.

Raytheon Company: *See—*
Dudley, Kenneth W.; Teich, Wesley W.; and Bowen, Robert F., 4,350,859, Cl. 219-10.55F.

RCA Corporation: *See—*
Berry, David A., 4,351,048, Cl. 369-288.000.
Catanese, Carmen A.; and Bloom, Stanley, 4,350,922, Cl. 313-402.000.
Elliott, Charles A., 4,351,046, Cl. 369-233.000.
Gillberg, James E., 4,350,906, Cl. 307-469.000.
Harlan, Wayne E., 4,350,995, Cl. 358-37.000.
Harlan, Wayne E., 4,351,003, Cl. 358-166.000.
Hughes, Richard H., 4,350,923, Cl. 313-414.000.
Marschka, Frank D., 4,350,925, Cl. 313-451.000.

Reboux, Jean B.: *See—*
Cannavo, Christian G.; Cousin, Georges; Espagnacq, Andre; Frayssac, Jacques X.; Laine, Loic Y.; Midrouillet, Daniel J.; Pintenat, Andre M.; and Reboux, Jean B., 4,350,096, Cl. 102-209.000.

Reczek, James A.; and Welter, Thomas R., to Eastman Kodak Company. Photographic elements and film units containing imidomethyl blocked photographic reagents. 4,350,752, Cl. 430-219.000.

Redlich, Horst; Borchard, Heinz; and Ihlenburg, Rainer, to Licentia Patent-Verwaltungs-G.m.b.H. Centering of a disc-shaped record carrier on a turntable. 4,351,047, Cl. 369-270.000.

Reed, Russell, Jr.: *See—*
Kincaid, John F.; and Reed, Russell, Jr., 4,350,542, Cl. 149-11.000.

Regie Nationale des Usines Renault: *See—*
Bascou, Jacques, 4,350,376, Cl. 292-263.000.

Reily, William S., to United States Gypsum Company. Wear and water resistant plaster articles. 4,350,736, Cl. 428-341.000.

Reinhardt, Hans: *See—*
Andersson, Sven O. S.; Ottertun, Harald D.; and Reinhardt, Hans, 4,350,667, Cl. 423-24.000.

Reinking, Klaus: *See—*
Schmidt, Manfred; and Reinking, Klaus, 4,350,793, Cl. 525-133.000.

Rek, Johannes H. M., to Internationale Octrooi Maatschappij "Octropa" B.V. Plastic fat based material and products therefrom. 4,350,715, Cl. 426-570.000.

Relyveld, Edgar R.; and Henocq, Emile, to Institut Pasteur. Allergen composition and method for preparation thereof. 4,350,686, Cl. 424-88.000.

Rempfler, Hermann: *See—*
Bohner, Beat; and Rempfler, Hermann, 4,350,521, Cl. 71-94.000.

Renault Sport: *See—*
Boudy, Jean-Pierre, 4,350,128, Cl. 123-369.000.

Rentzea, Costin; Zeeh, Bernd; Pommer, Ernst-Heinrich; and Mappes, Celia J., to BASF Aktiengesellschaft. 1-(Trihalomethyl-sulfenyl)-4-aryl-1,2,4-triazolin-5-ones, and process for controlling fungi. 4,350,701, Cl. 424-269.000.

Repa Feinstanzwerk GmbH: *See—*
Adomeit, Heinz D., 4,350,313, Cl. 242-107.40C.

Research Corporation: *See—*
Kay, David B.; and Wheeless, Leon L., Jr., 4,350,892, Cl. 250-461.200.
Keith, Alec D.; and Snipes, Wallace, 4,350,707, Cl. 424-346.000.
Lee, Kuo-Hsiung, 4,350,638, Cl. 549-275.000.
Lipton, Allan; and Kepner, Nancy, 4,350,687, Cl. 424-177.000.
Stammer, Charles H., 4,350,628, Cl. 260-112.50R.

Respiratory Care, Inc.: *See—*
de la Cruz, Exequiel, 4,350,647, Cl. 261-65.000.

Retallick, William B.; and Smithson, Harold R. Cylindrical metal honeycomb catalyst supports, and method for forming them. 4,350,617, Cl. 252-477.00R.

Rhone-Poulenc Industries: *See—*
Bigot, Bernard; and Gielly, Jean-Francois, 4,350,671, Cl. 423-320.000.
Boudot, Bernard; and Nury, Georges, 4,350,558, Cl. 156-617.0SP.
Boudot, Bernard; and Nury, Georges, 4,350,559, Cl. 156-617.0SP.
Prudhon, Francois; and Scicluna, Augustin, 4,350,101, Cl. 110-238.000.

Riccobono, Paul J. Humidity-sensitive broken panel alarm. 4,350,978, Cl. 340-550.000.

Rice, Doris M.: *See—*
Dominguez, Richard J. G.; Rice, Doris M.; and Zimmerman, Robert L., 4,350,778, Cl. 521-118.000.

Riceberg, Louis J., to Corning Glass Works. Stabilization of sensitive biologically active intermediate metabolites such as folic acid derivatives. 4,350,659, Cl. 422-61.000.

Rich Products Corporation: *See—*
Kahn, Marvin L.; and Eapen, Kuttikandathil E., 4,350,711, Cl. 426-102.000.

Richard, Maurice E.; and Winarski, Daniel J., to International Business Machines Corporation. Tape reel hub including a cantilever beam section to reduce tape tenting. 4,350,309, Cl. 242-68.300.

Richards, Kennith E., to Mackey, Thomas E.; and Haire, Donal. Remote control car heater. 4,350,287, Cl. 237-12.30A.

Richardson, Roy; and Czenkusz, Bernard, to Yorkshire Electricity Board. Method of and apparatus for testing wooden poles. 4,350,044, Cl. 73-600.000.

Richer, Donald K., to Foxboro Company, The. Process control system with improved system security features. 4,351,023, Cl. 364-187.000.

Richey, Robert J., Jr.: *See—*
Huang, Shih L.; McQuillen, Edward J.; and Richey, Robert J., Jr., 4,350,728, Cl. 428-105.000.

Richter, Hermann: *See—*
Durr, Heinrich; Richter, Hermann; Weber, Wendelin; Goerke, Burkhard; and Engler, Peter, 4,350,450, Cl. 400-124.000.

Ricoh Company Ltd.: *See—*
Kondoh, Shiroh, 4,350,432, Cl. 355-3.0DD.
Ohnuma, Teruyuki; Miyakawa, Seiichi; and Oyama, Hajime, 4,350,749, Cl. 430-100.000.
Suzuki, Shigeru; Suzuki, Minoru; Suzuki, Koichi; Omi, Kyoji; Nagahara, Yasumori; Kagari, Yoshiharu; Hashimoto, Makoto; and Mori, Goro, 4,350,750, Cl. 430-125.000.

Riebel, Hans-Jochem; Maurer, Fritz; and Priesnitz, Uwe, to Bayer Aktiengesellschaft. Process for the preparation of 1,1-dichloroalkenes. 4,350,824, Cl. 560-124.000.

Riebel, Hans-Jochem: *See—*
Fuchs, Rainer; Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, 4,350,640, Cl. 260-465.00D.

Rieber, Norbert; Bohm, Heinrich; Platz, Rolf; and Fuchs, Werner, to BASF Aktiengesellschaft. 1-Hydroxypyrazole. 4,350,819, Cl. 548-375.000.

Riedl, Reinhold, to Hombak Maschinenfabrik GmbH u. Conkg. Arrangement for cutting wood into chips. 4,350,191, Cl. 144-172.000.
Riffe, Delmar R., to Westinghouse Electric Corp. Cooling system for rotor of a dynamoelectric machine. 4,350,908, Cl. 310-61.000.
Rispin, Peter P.: *See*—
Knutson, Richard K.; Webster, Bruce L.; Johnston, John W.; and Rispin, Peter P., 4,350,110, Cl. 114-243.000.
Risse, Friedrich: *See*—
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,349,948, Cl. 29-157.10R.
Ritchie, Leon T.: *See*—
Douty, George H.; Landis, John M.; and Ritchie, Leon T., 4,350,402, Cl. 339-74.00R.
Riverside Research Institute: *See*—
Lizzi, Frederic L.; and Weil, Kurt W., 4,350,917, Cl. 310-320.000.
Ro, David H.; Klar, Erhard; and Whitman, Charles I., to SCM Corporation. Corrosion-resistant powder-metallurgy stainless steel powders and compacts therefrom. 4,350,529, Cl. 75-228.000.
Robert Bosch GmbH: *See*—
Harsch, Klaus; and Schulzke, Peter, 4,350,132, Cl. 123-490.000.
Olbrich, Gottfried; and Pfeffer, Peter, 4,350,219, Cl. 180-65.00R.
Robert, Christian C.: *See*—
Goldschild, Pierre H.; and Robert, Christian C., 4,350,205, Cl. 166-375.000.
Roberts, David H.: *See*—
Porter, Ned A.; Ziegler, Carl B., Jr.; and Roberts, David H., 4,350,834, Cl. 568-568.000.
Roberts, Marvin A. Demand drive component. 4,350,278, Cl. 226-190.000.
Robertson, Harry A., Jr.: *See*—
McTavish, James C., 4,350,349, Cl. 277-199.000.
Robichaud, John F. Solid fuel heater with improved primary/secondary air control system. 4,350,139, Cl. 126-77.000.
Robinson, Grenville A.; Kember, Peter N.; and Burns, Derek K., to EMI Limited. Ammonia gas sensors. 4,350,660, Cl. 422-90.000.
Robinson, Joseph G.; and Brain, Sally A., to Coal Industry (Patents) Limited. Phenolated naphthalene formaldehyde resin varnish. 4,350,623, Cl. 524-391.000.
Robinson, Norman R. Filtration system. 4,350,590, Cl. 210-243.000.
Rock, Erich; and Brunner, Josef, to Julius Blum Gesellschaft m.b.H. Multi-pintle hinge with sliding spring closing mechanism. 4,349,941, Cl. 16-288.000.
Rockwell International Corporation: *See*—
August, Rudolf R.; Anderson, Dean B.; and Yao, Shi-Kay, 4,350,916, Cl. 310-313.00B.
Pommerrenig, Dieter H., 4,350,886, Cl. 250-239.000.
Rodriguez, Celestino, to Bendix Corporation, The. Spindle orient device. 4,350,939, Cl. 318-592.000.
Rogers, Philip J., to Pilkington P.E. Limited. Transfer lens and head-down display using the same. 4,350,411, Cl. 350-174.000.
Rogers, R. Barry, to White-McKee Inc. Tank-baffle system. 4,350,258, Cl. 220-22.000.
Rogers, Walter C., Jr., to Parma Corporation. Reclining chair with improved actuation. 4,350,386, Cl. 297-85.000.
Rogers, Walter C., Jr., to Parma Corporation. Reclining chair with improved actuation. 4,350,387, Cl. 297-85.000.
Rogner, Thomas; and Frank, Anton, to Voith Turbo GmbH & Co. KG. Pumping apparatus for fluid. 4,350,011, Cl. 60-337.000.
Rohm and Haas Company: *See*—
Bayer, Horst O.; and Swithenbank, Colin, 4,350,522, Cl. 71-111.000.
Rojey, Alexandre, to Institut Francais du Petrole. Process for producing heat by means of a heat pump operated with a fluid mixture as working agent and air as heat source. 4,350,020, Cl. 62-93.000.
Rood, Alvin A., to Nordson Corporation. Method for manufacturing an airless spray nozzle. 4,349,947, Cl. 29-157.00C.
Roos, Ermi: *See*—
Gilbert, Ian D.; Halloran, Michael T.; and Roos, Ermi, 4,350,292, Cl. 239-7.000.
Rose, Paul F.: *See*—
Kuhn, William T., 4,350,275, Cl. 226-14.000.
Rose, Thomas H.: *See*—
Kuhn, William T., 4,350,275, Cl. 226-14.000.
Rosemeier, Friedrich; and Kerber, Helmut, to Gambro Dialysatoren KG. Transferring means for use in a device for separating liquids. 4,350,284, Cl. 233-27.000.
Rosenbaum, Erik, to United States of America, Navy. Feedback signal amplifier. 4,350,959, Cl. 330-110.000.
Rosenfeld, Gideon, to Scitex Corporation Ltd. Screened image reproduction. 4,350,996, Cl. 358-75.000.
Rosengren, Bengt; and Persson, Christer. Solar collector. 4,350,146, Cl. 126-447.000.
Rosenthal, Joel W.; Dahlberg, Arthur J.; and Kuehler, Christopher W., to Chevron Research Company. Two-stage coal liquefaction process with process-derived solvent. 4,350,582, Cl. 208-8.0LE.
Roske, Eckhard: *See*—
Straub, Ferdinand; Lang, Siegfried; and Roske, Eckhard, 4,350,791, Cl. 525-123.000.
Rosso, John R.: *See*—
Valiga, Richard E.; and Rosso, John R., 4,350,461, Cl. 405-128.000.
Roth, Donald J., to Continental Group, Inc., The. Closure having opening means. 4,350,261, Cl. 220-270.000.
Rotork Controls Limited: *See*—
Fry, Jeremy J.; and Warnett, Christopher, 4,350,081, Cl. 92-128.000.
Rouget, Jean P.; and Roustant, Edmond, to Thomson-Brandt. Mechanical and electrical coupling device for charges, particularly military charges. 4,350,074, Cl. 89-1.50D.
Roussel Uclaf: *See*—
Clements-Jewery, Stephen; Westwood, Robert; and Hairsine, Peter W., 4,350,697, Cl. 424-256.000.
Martel, Jacques; Tessier, Jean; and Teche, Andre, 4,350,637, Cl. 549-304.000.
Westwood, Robert; Tully, Wilfred R.; and Murdoch, Robert, 4,350,695, Cl. 424-251.000.
Roustant, Edmond: *See*—
Rouget, Jean P.; and Roustant, Edmond, 4,350,074, Cl. 89-1.50D.
Rowe, Eugene H.; and Howard, Frank H., to B. F. Goodrich Company, The. Polyester resins toughened with vinyl terminated liquid polymers. 4,350,789, Cl. 525-31.000.
Roy, Leo T., to Craft, Inc. Easel hinge construction. 4,349,942, Cl. 16-376.000.
Rozhansky, Boris: *See*—
Broutman, Lawrence J.; Rozhansky, Boris; and Zlatkevich, Lev, 4,350,495, Cl. 23-230.0PC.
Rubio, Jose V., Jr. Coconut shredder and cutter appliance. 4,350,088, Cl. 99-538.000.
Ruegg, Hans, to Von Roll AG. Combined combustion and melting furnace for solid, pasty and liquid waste materials. 4,350,102, Cl. 110-246.000.
Ruhr Kohle AG: *See*—
Wild, Heinz W., 4,350,392, Cl. 299-13.000.
Ruiz de Palacios, Jose I., to Sistemas Naturales Internacionales, S.A., Sinatin, S.A. Natural oak aroma for accelerating aging of alcoholic beverages. 4,350,708, Cl. 426-11.000.
Russel, Matthew J.: *See*—
Holzhauser, Ronald C.; McGlen, James A.; and Russel, Matthew J., 4,350,329, Cl. 271-9.000.
Rusteberg, Robert K., to Panlmatic Company. Bottle storage rack. 4,350,253, Cl. 211-74.000.
Ryan, James M.: *See*—
Holmes, Arthur S.; and Ryan, James M., 4,350,511, Cl. 62-17.000.
Ryobi Ltd.: *See*—
Ishii, Koji, 4,350,093, Cl. 101-217.000.
S.E.G. Resistor A.B.: *See*—
Soderholm, Arne, 4,350,218, Cl. 177-255.000.
Saab-Scania Aktiebolag: *See*—
Parsson, Nils O.; and Nilsson, Sten E., 4,350,389, Cl. 297-410.000.
Sable Freres International: *See*—
Aondetto, Bernard, 4,350,317, Cl. 248-588.000.
Sagae, Syoji; Matsuda, Yasumasa; Kasahara, Masatoshi; and Suzuki, Masayoshi, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Ink-jet printing apparatus. 4,350,989, Cl. 346-140.00R.
Saiag S.p.A. Industria Articoli Gomma: *See*—
Azzola, Roberto, 4,350,084, Cl. 98-2.000.
St. Denis, Joseph F. Support for grinding thread cutting tools. 4,349,990, Cl. 51-220.000.
Saint Gobain Industries: *See*—
Bonnet, Alain, 4,350,483, Cl. 425-115.000.
Saint Gobain Vitrage: *See*—
Felbinger, Willy, 4,351,016, Cl. 361-181.000.
Saito, Kazuo: *See*—
Ito, Hiroshi; and Saito, Kazuo, 4,350,229, Cl. 188-73.450.
Saito, Motoyuki: *See*—
Fukutome, Satoru; Hatanaka, Hideo; and Saito, Motoyuki, 4,351,041, Cl. 368-88.000.
Saito, Tsukasa: *See*—
Kato, Matsuo; Ohtsuki, Tomonari; Igarashi, Yoshiaki; Saito, Tsukasa; and Suzuki, Toshiaki, 4,350,409, Cl. 339-186.00M.
Saitoh, Joichi, to Kotobuki Seihan Printing Co., Ltd. Blanket for offset printing. 4,350,735, Cl. 428-328.000.
Sakai, Hiromitsu: *See*—
Araki, Ken; Sakai, Hiromitsu; and Sugiura, Yutaka, 4,350,717, Cl. 427-8.000.
Sakamaki, Hisashi: *See*—
Yagasaki, Toshiaki; Masuda, Shunichi; Shimizu, Katsuichi; and Sakamaki, Hisashi, 4,350,436, Cl. 355-14.0SH.
Sakata, Kazuhiro; Yuminaka, Takeo; Nakazato, Masao; Yoneda, Kenji; Kuzunuki, Soshiro; and Katayama, Yasunori, to Hitachi, Ltd. Elevator control system. 4,350,225, Cl. 187-29.00R.
Sakata, Takayoshi: *See*—
Kuwabara, Eiji; Sakata, Takayoshi; Kawauchi, Noboru; Ide, Yuuichi; and Matsuo, Takeshi, 4,350,023, Cl. 62-176.00E.
Sakurai, Kazuhiro: *See*—
Kawata, Shoji; Hattori, Kyo; and Sakurai, Kazuhiro, 4,350,319, Cl. 251-65.000.
Salazar, Jorge. Soccer board game. 4,350,343, Cl. 273-247.000.
Saleemuddin, Mohammed: *See*—
Zimmermann, Ulrich; Saleemuddin, Mohammed; and Pilwat, Gunter, 4,350,767, Cl. 435-183.000.
Saletta, Gary F.: *See*—
Elms, Robert T.; Engel, Joseph C.; Mercier, Bernard J.; Saletta, Gary F.; and Wilson, John T., 4,351,012, Cl. 361-96.000.
Salomon, Georges P. J., to Ets Francois Salomon & Fils. Ski brake. 4,350,364, Cl. 280-605.000.
Samsonite Corporation: *See*—
Bromley, Robert L., 4,350,030, Cl. 70-70.000.
Samuels, Michael W.: *See*—
Zasio, John J.; and Samuels, Michael W., 4,350,866, Cl. 219-121.0EM.

Samuelsson, Lars E.: *See*—
Olsson, Jan G.; and Samuelsson, Lars E., 4,350,360, Cl. 280-279.000.

Sanchez, Pierre; and Vitalis, Andre, to Societe Anonyme dite: Sea Tank Co. Platform for utilization of the thermal energy of the sea. 4,350,014, Cl. 60-641.700.

Sandegard, Jan D. Device for use when training the appropriate handling of a dislocated injury on a part of a body. 4,350,490, Cl. 434-274.000.

Sanders Associates, Inc.: *See*—
Mortimer, Thomas J., 4,350,999, Cl. 358-147.000.

Sanders, James M.: *See*—
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,350,823, Cl. 560-120.000.

Sandmann, Harald: *See*—
Hartinger, Edmund; Julke, Elias; and Sandmann, Harald, 4,350,620, Cl. 252-628.000.

Sandoz Ltd.: *See*—
Baumann, Hans-Peter, 4,350,493, Cl. 8-617.000.
Stadler, Paul; and Troxler, Franz, 4,350,634, Cl. 260-326.13B.

Sandy, Julius W.: *See*—
Isham, Leonard E.; Peplow, Marvin J.; Sandy, Julius W.; and ViPond, Clyde M., 4,350,061, Cl. 81-9.510.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Yukishima, Susumu, 4,350,010, Cl. 60-310.000.

Santangelo, Francesco: *See*—
de Castiglione, Roberto; Faoro, Fiorenzo; Perseo, Giuseppe; Piani, Silvano; and Santangelo, Francesco, 4,350,627, Cl. 260-112.50E.

Santilli, Arthur A.: *See*—
Scotese, Anthony C.; and Santilli, Arthur A., 4,350,817, Cl. 546-122.000.

Santini, Hugo A. E.: *See*—
Grandia, Johannes; McChesney, William G.; Santini, Hugo A. E.; and Turk, Harold L., 4,350,116, Cl. 118-500.000.

Santoro, Dario S.; Schultz, Garry; and Miano, Henry. Desiccant cap. 4,350,508, Cl. 55-275.000.

Sanyo Electric Co., Ltd.: *See*—
Morimoto, Masao, 4,350,472, Cl. 415-125.000.
Tokumatsu, Hiromu, 4,351,000, Cl. 358-158.000.
Yoshida, Masahiko, 4,350,858, Cl. 219-10.55B.

Sarrine, Robert J., to Transidyne General Corporation. Endoscope. 4,350,147, Cl. 128-4.000.

Sasaki, Kouji; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Takemori, Satoshi; and Ikemoto, Norio, to Hitachi, Ltd. Coaxial type gas-flow laser device. 4,351,052, Cl. 372-58.000.

Sato, Hideaki: *See*—
Imai, Nobuhiro; Kono, Kimio; Hoshito, Kazuo; Kiyohara, Takehiko; and Sato, Hideaki, 4,351,005, Cl. 358-300.000.

Sato, Hirochika, to Kabushiki Kaisha Daini Seikosha. Contour vibration mode piezoelectric resonator. 4,350,918, Cl. 310-367.000.

Sato, Yasushi, to Tokyo Shibaura Denki Kabushiki Kaisha. Complementary MOS logic decoder circuit. 4,350,905, Cl. 307-451.000.

Saul, Alfred: *See*—
Heberling, Walter; Muller, Wolfgang; Langenberg, Werner; Behrens, Gerhard; and Saul, Alfred, 4,350,393, Cl. 299-50.000.

Saul, John R.: *See*—
Hall, William H.; and Saul, John R., 4,350,845, Cl. 179-1.00J.

Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., to Essex Group, Inc. Power insertable nylon coated magnet wire. 4,350,737, Cl. 428-383.000.

Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., to Essex Group, Inc. Power insertable polyamide-imide coated magnet wire. 4,350,738, Cl. 428-383.000.

Sauter, Hubert; Zeeh, Bernd; Buschmann, Ernst; and Jung, Johann, to BASF Aktiengesellschaft. Plant growth regulating substituted alkylammonium salts. 4,350,518, Cl. 71-88.000.

Savin Corporation: *See*—
Landa, Benzion, 4,350,333, Cl. 271-217.000.
Landa, Benzion, 4,350,447, Cl. 400-118.000.

Schaefer, John O.: *See*—
Field, Thomas R.; Jagodzinski, Peter F.; King, James F.; and Schaefer, John O., 4,350,453, Cl. 400-208.000.

Schaffer, Stephen P., to J. M. Ney Company, The. Palladium/silver alloy for use with dental procelains. 4,350,526, Cl. 75-134.00B.

Schalkowsky, Samuel; and Whitley, Donald, to Spinal Systems Inc. Gravimetric diluter. 4,350,186, Cl. 141-83.000.

Schamaun, Roger G.: *See*—
Liska, Donald J.; Schamaun, Roger G.; Clark, Donald C.; Potter, R. Christopher; and Frank, Joseph A., 4,350,921, Cl. 313-360.100.

Schankat, Norbert: *See*—
Paulus, Rudolf; Schankat, Norbert; Weinzierl, Manfred; and Franke, Walter, 4,350,434, Cl. 355-14.0SH.

Schaper, Lambert: *See*—
Post, Martin F. M.; and Schaper, Lambert, 4,350,772, Cl. 518-714.000.

Scharfenberger, James A., to Ransburg Corporation. Uncontaminated purge solvent recovery system. 4,350,720, Cl. 427-401.000.

Schatzler, Walter, to Webasto-Werk W. Baier GmbH & Co. Sliding roof for vehicles. 4,350,385, Cl. 296-222.000.

Scheidegger, Hans; Flensberg, Hermann; and Bauhofer, Roland, to Ciba-Geigy Corporation. Process for the dyeing of textile material and apparatus for carrying out the process. 4,350,494, Cl. 8-636.000.

Scherbatskoy, Serge A. Systems, apparatus and methods for measuring while drilling. 4,351,037, Cl. 367-85.000.

Schiller, Harold. Fusing fluid for solder-plated circuit boards. 4,350,602, Cl. 252-75.000.

Schirtzinger, Joseph F., to Sea-Log Corporation. Semi-submersible tanker with directional ice cutters. 4,350,114, Cl. 114-339.000.

Schlumberger Technology Corporation: *See*—
Goldschild, Pierre H.; and Robert, Christian C., 4,350,205, Cl. 166-375.000.

Schmelzer, Hans G.; Schmidt, Manfred; and Yeater, Robert P., to Mobay Chemical Corporation. Thermoplastic ternary molding composition of polyurethane polyphosphonates and polycarbonate resins. 4,350,799, Cl. 525-453.000.

Schmelzer, Lynn A.; and Fouser, W. Thomas, to Hyster Company. Vibratory compaction system. 4,350,460, Cl. 404-117.000.

Schmidt, Manfred; and Reinking, Klaus, to Bayer Aktiengesellschaft. Flame-retardant composition of polyphenylene ether, polystyrene resin and polyphosphonate. 4,350,793, Cl. 525-133.000.

Schmidt, Manfred: *See*—
Schmelzer, Hans G.; Schmidt, Manfred; and Yeater, Robert P., 4,350,799, Cl. 525-453.000.

Schmiedel, Klaus: *See*—
Hesse, Wolfgang; Landauer, Franz; and Schmiedel, Klaus, 4,350,800, Cl. 525-480.000.

Schmits, Heinz-Herbert: *See*—
Heinemann, Otto; Schmits, Heinz-Herbert; Philipp, Rainer; and Berger, Artur, 4,350,244, Cl. 198-773.000.

Schmitt, Frederick L.: *See*—
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,350,733, Cl. 428-290.000.
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,350,823, Cl. 560-120.000.

Schmittmann, Hans B., to Dr. H. Schmittmann GmbH. Procedure for manufacturing saponine extract. 4,350,688, Cl. 424-182.000.

Schmoldt, Harm; Kock, Klaus; and Strathmann, Heinrich, to Forschungsinstitut Berghof GmbH. Electrodialysis-cell assembly. 4,350,581, Cl. 204-301.000.

Schnegg, Peter: *See*—
Blank, Heinz U.; Klag, Gunther; and Schnegg, Peter, 4,350,566, Cl. 162-72.000.

Schneider, Heinz-Walter: *See*—
Kummer, Rudolf; Taglieber, Volker; Weis, Franz-Josef; and Schneider, Heinz-Walter, 4,350,572, Cl. 203-35.000.

Schockman, Robert L.: *See*—
Busse, Vernon E.; and Schockman, Robert L., 4,350,090, Cl. 100-216.000.

Schoening, Josef: *See*—
Schwiers, Hans-Georg; and Schoening, Josef, 4,349,991, Cl. 52-21.000.

Schoenlein, William J., to IBM Patent Operations. Ribbon cartridge including hub brake. 4,350,454, Cl. 400-234.000.

Schofield, George L., Jr., to Xenex Corporation. Solid state self-checking relay. 4,351,014, Cl. 361-100.000.

Scholl, Richard A.; and Cole, John L., to Ferrofluidics Corporation. Method for circumferential dimension measuring and control in crystal rod pulling. 4,350,557, Cl. 156-601.000.

Schoonejongen, Ronald J.: *See*—
Hilson, David G.; Johnson, Gary W.; and Schoonejongen, Ronald J., 4,350,618, Cl. 252-514.000.

Schornig, Eberhard, to Hoechst Aktiengesellschaft. Device for uniformly pressing on and releasing the pressure from rub-out bars. 4,349,932, Cl. 15-77.000.

Schrijver, Gerrit J.; and Wijtsma, Jorrit, to U.S. Philips Corporation. Irradiation apparatus. 4,350,894, Cl. 250-504.00R.

Schroter, Herbert, to Hoechst Aktiengesellschaft. Light dosing device. 4,350,438, Cl. 355-68.000.

Schubert, John C.: *See*—
Cyr, Stephen J.; Schubert, John C.; and Dehlinger, John, 4,350,730, Cl. 428-215.000.

Schultes, Herbert: *See*—
Engelsmann, Dieter; Maas, Dieter; Zattler, Kurt; and Schultes, Herbert, 4,350,420, Cl. 354-145.000.

Schultz, Garry: *See*—
Santoro, Dario S.; Schultz, Garry; and Miano, Henry, 4,350,508, Cl. 55-275.000.

Schulz, Adalbert; and Borchert, Werner, to Kleiber & Schulz, Inc. Extractor for recirculating cleaning bodies in a fluid-circulation system. 4,350,202, Cl. 165-95.000.

Schulz, Franz F.: *See*—
Frohling, Peter; Schulz, Franz F.; and Wiedemer, Karl, 4,350,310, Cl. 242-75.200.

Schulz, Horst-Hermann; and Koneke, Johannes, to SKF Kugellagerfabriken GmbH. Rolling bearing having separate flange ring with saw-tooth-shaped flange. 4,350,398, Cl. 308-216.000.

Schulze, Dieter: *See*—
Blase, Helmut; Hogemann, Arend; and Schulze, Dieter, 4,350,255, Cl. 212-268.000.

Schulzke, Peter: *See*—
Harsch, Klaus; and Schulzke, Peter, 4,350,132, Cl. 123-490.000.

Schwartz, Albert B., to Mobil Oil Corporation. Catalytic cracking catalyst. 4,350,614, Cl. 252-455.00Z.

Schwartz, Henry D.; Krull, Irwin H.; Clement, Carl J.; Stengel, Frederick H.; and Hayslett, David D., to Applied Medical Technology, Inc. Testing apparatus for measuring ions in fluids. 4,350,579, Cl. 204-195.00R.

Schwarz, Ingrid: *See*—
Schwarz, Karl H.; and Schwarz, Ingrid, 4,350,878, Cl. 235-78.0RC.

Schwarz, Josef: *See*—
Kuhnle, Ernst; and Schwarz, Josef, 4,350,217, Cl. 177-246.000.
Schwarz, Karl H.; and Schwarz, Ingrid. Conception control calendar. 4,350,878, Cl. 235-78.0RC.
Schwarzler, Hans-Juergen: *See*—
Blaha, Alfred; and Schwarzler, Hans-Juergen, 4,350,983, Cl. 343-103.000.
Schwemmer, Leonard J., to Lord Corporation. Crowner noise shield. 4,350,000, Cl. 53-287.000.
Schwiers, Hans-Georg; and Schoening, Josef, to Hochtemperatur-Reaktorbau GmbH. Closing device for large passages in a prestressed pressure vessel. 4,349,991, Cl. 52-21.000.
Scicluna, Augustin: *See*—
Prudhon, Francois; and Scicluna, Augustin, 4,350,101, Cl. 110-238.000.
Scitex Corporation Ltd.: *See*—
Rosenfeld, Gideon, 4,350,996, Cl. 358-75.000.
SCM Corporation: *See*—
Ro, David H.; Klar, Erhard; and Whitman, Charles I., 4,350,529, Cl. 75-228.000.
Scoggins, Lacey E.: *See*—
Tieszen, Dale O.; and Scoggins, Lacey E., 4,350,810, Cl. 528-388.000.
Scotese, Anthony C.; and Santilli, Arthur A., to American Home Products Corporation. 4-Cl, Br or I-3-Carboxy or cyano-1,2-dihydro-2-oxo-1,8-naphthyridine derivatives. 4,350,817, Cl. 546-122.000.
Scott, F. Brantley, to Lone Star Medical Products, Inc. Expanding dilator. 4,350,151, Cl. 128-17.000.
Scott, William J., to Ideal Industries, Inc. Electrical connector. 4,350,841, Cl. 174-87.000.
Scotti, Frank; and Page, Edward H. Polymeric foam caulking compositions. 4,350,774, Cl. 521-95.000.
Scovell, Peter D.: *See*—
Young, John M.; and Scovell, Peter D., 4,350,537, Cl. 148-1.500.
Sea-Log Corporation: *See*—
Schirtzinger, Joseph F., 4,350,114, Cl. 114-339.000.
Seaburg, Paul A.: *See*—
Lautensleger, Richard W.; Shepard, Richard D.; and Seaburg, Paul A., 4,349,996, Cl. 52-655.000.
Searle, Robert F., to Vibrac Corporation. Electric motor manufacture. 4,350,914, Cl. 310-194.000.
Searles, John E.: *See*—
Griffiths, Ronald S.; and Searles, John E., 4,350,265, Cl. 222-38.000.
Security Trust Company of Rochester: *See*—
Alsina, Pierre A., 4,349,965, Cl. 33-288.000.
Seddon, Alan E., to BICC Limited. Overhead electric traction systems. 4,350,851, Cl. 191-39.000.
Seeger, Gunter; and Wiemann, Dieter, to Bison-Werke Bahre und Greten GmbH & Co. KG. Forming line for use in the manufacture of particle boards. 4,350,484, Cl. 425-140.000.
Seiko Koki Kabushiki Kaisha: *See*—
Kitai, Kiyoshi; Morino, Yukio; Kato, Shogo; and Watanabe, Masanori, 4,350,427, Cl. 354-238.000.
Ogihara, Masuo; Chimura, Kozo; and Shinozaki, Nobuo, 4,351,043, Cl. 368-252.000.
Seiler, Erhard: *See*—
Theysohn, Rainer; Boehlke, Klaus; Seiler, Erhard; and Welz, Martin, 4,350,652, Cl. 264-104.000.
Seilly, Alec H., to Lucas Industries Limited. Inductive type displacement transducers. 4,350,954, Cl. 324-208.000.
Selm, Robert P.; and Shepard, Leland M., to Wilson & Company. Apparatus and process for treatment of sludge. 4,350,597, Cl. 210-710.000.
Semmler, Hans-Joachim: *See*—
Hoffmann, Bernd; Jung, Siegfried; and Semmler, Hans-Joachim, 4,350,206, Cl. 169-47.000.
Seno, Kohichi: *See*—
Hamada, Isao; Nakayama, Hiroshi; Kawakami, Nobuyoshi; Azami, Hirotaka; Ikeda, Tadasu; Yukawa, Yasumasa; Mitani, Hiroshi; Ohmori, Takashi; Kimura, Masanobu; and Seno, Kohichi, 4,350,510, Cl. 55-349.000.
Sergeev, Igor A.: *See*—
Alexandrov, Vyacheslav S.; Guschin, Alexandr E.; Zavodov, Rudolf V.; Zhukova, Elena I.; Ivanov, Alexandr A.; Fofanova, Tatyana S.; Mikhailov, Evgeny I.; Dianov, Ivan M.; Luzin, Pavel M.; Sergeev, Igor A.; Pankratova, Lidia A.; Krylova, Vera E.; and Leibenzon, Semen A., 4,350,482, Cl. 425-83.100.
Seto, Susumu; Tokuhara, Mitsuhiro; Takemura, Yukio; Yamada, Yu; and Kuwayama, Takeshi, to Canon Kabushiki Kaisha. Scanning illuminator. 4,350,433, Cl. 355-8.000.
Seytre, Bruno; and Bricaud, Herve, to Socapex. Connecting-strip for plug-in cards and a connector fitted with connecting-strips of this type. 4,350,403, Cl. 339-91.00R.
Shadden, Oliver W.; and Howard, Jerry W. Diker, apparatus, system and process of operation. 4,350,210, Cl. 172-143.000.
Shah, Hasmukh R.; Jones, Thaddeus M.; and Hemingway, Bruce, to UMC Industries, Inc. Data acquisition unit. 4,350,238, Cl. 194-1.00N.
Shapiro, Howard S., to ICI Americas Inc. Pyrrolo [3,4-c]quinoline compounds. 4,350,814, Cl. 546-84.000.
Sharp Kabushiki Kaisha: *See*—
Mochizuki, Daisuke; and Kitano, Shigeru, 4,351,008, Cl. 360-40.000.
Morihisa, Mitsuo; and Inoue, Tadao, 4,351,021, Cl. 363-49.000.
Sharp, Shelby P.; and Yarborough, Lyman, to Standard Oil Company (Indiana). Method and composition for inhibiting corrosion in high temperature, high pressure gas wells. 4,350,600, Cl. 252-8.55E.
Shaw, Jack H.: *See*—
Wyatt, William G.; and Shaw, Jack H., 4,350,915, Cl. 310-306.000.
Sheehy, George E.; and Bittar, Joseph, to Otis Elevator Company. Elevator floor stop look-ahead. 4,350,226, Cl. 187-29.00R.
Shell Oil Company: *See*—
Bannon, Robert P., 4,350,501, Cl. 55-26.000.
Petty, Walter L., 4,350,642, Cl. 260-465.00D.
Poll, Ian, 4,350,103, Cl. 110-264.000.
Post, Martin F. M.; and Schaper, Lambert, 4,350,772, Cl. 518-714.000.
Syrier, Johannes L. M., 4,350,820, Cl. 549-545.000.
Syrier, Johannes L. M., 4,350,821, Cl. 549-545.000.
Shelnut, James; Golda, Eugene; Wilkes, Alan; and Shimazu, Ken-ichi, to Polychrome Corporation. Positive acting composition yielding pre-development high visibility image after radiation exposure comprising radiation sensitive diazo oxide and haloalkyl-s-triazine with novolak and dyestuff. 4,350,753, Cl. 430-190.000.
Shelton, Joe, to United States of America, Army. Hollow beam electron source. 4,350,926, Cl. 313-455.000.
Shepard, Leland M.: *See*—
Selm, Robert P.; and Shepard, Leland M., 4,350,597, Cl. 210-710.000.
Shepard, Richard D.: *See*—
Lautensleger, Richard W.; Shepard, Richard D.; and Seaburg, Paul A., 4,349,996, Cl. 52-655.000.
Shepherd, Robert G.: *See*—
Albright, Jay D.; Miner, Thomas G.; and Shepherd, Robert G., 4,350,822, Cl. 560-45.000.
Sherman, Daniel. Refillable rodent bait station container. 4,349,982, Cl. 43-131.000.
Sherman, Daniel S. Contact poison delivery device. 4,349,981, Cl. 43-131.000.
Shih, David H.: *See*—
Christensen, Burton G.; and Shih, David H., 4,350,631, Cl. 260-245.20T.
Shiibayashi, Masao: *See*—
Tojo, Kenji; Ikegawa, Masato; Shiibayashi, Masao; and Imai, Masaya, 4,350,479, Cl. 418-55.000.
Shikaya, Yukihiro: *See*—
Hayasaka, Yoshiyuki; Ikeuchi, Ichiro; Matsumoto, Hajime; and Shikaya, Yukihiro, 4,349,997, Cl. 53-51.000.
Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, to Nissan Motor Co., Ltd. Selectively controlled air conditioner outlet system of a vehicle. 4,350,289, Cl. 237-12.30A.
Shimazu, Ken-ichi: *See*—
Shelnut, James; Golda, Eugene; Wilkes, Alan; and Shimazu, Ken-ichi, 4,350,753, Cl. 430-190.000.
Shimizu, Katsuichi: *See*—
Yagasaki, Toshiaki; Masuda, Shunichi; Shimizu, Katsuichi; and Sakamaki, Hisashi, 4,350,436, Cl. 355-14.0SH.
Shimizu, Tokuo: *See*—
Osada, Hajime; Kimura, Akiteru; Shimizu, Tokuo; Kitajima, Goro; Tomizawa, Yoshio; Kondo, Makoto; Motoyama, Kazuyasu; and Daigaku, Masaaki, 4,351,009, Cl. 360-105.000.
Shimokawa, Wataru; Ito, Yoshiaki; Kobayashi, Koichi; Fukumori, Katuaki; and Iwase, Nobukazu, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Synthetic resin emulsion and its uses. 4,350,788, Cl. 524-309.000.
Shimono, Junichi. Pushbutton operated door locks. 4,350,031, Cl. 70-315.000.
Shin, Paik W.: *See*—
Torok, Theodore E.; Shin, Paik W.; and Borzillo, Angelo R., 4,350,539, Cl. 148-31.500.
Shindo, Takemasa; Ito, Yoshikazu; and Arai, Kenichiro, to Shinshu Seiki Kabushiki Kaisha; and Kabushiki Kaisha Suwa Seikosha. Thermally sensitive printer. 4,350,907, Cl. 310-37.000.
Shine, John: *See*—
Baxter, John D.; Fettes, Ivy; and Shine, John, 4,350,764, Cl. 435-69.000.
Shinozaki, Nobuo: *See*—
Ogihara, Masuo; Chimura, Kozo; and Shinozaki, Nobuo, 4,351,043, Cl. 368-252.000.
Shinshu Seiki Kabushiki Kaisha: *See*—
Shindo, Takemasa; Ito, Yoshikazu; and Arai, Kenichiro, 4,350,907, Cl. 310-37.000.
Shionogi & Co., Ltd.: *See*—
Ogata, Masaru; and Matsumoto, Hiroshi, 4,350,635, Cl. 260-326.470.
Shirakura, Toshiharu: *See*—
Sasaki, Kouji; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Takemori, Satoshi; and Ikemoto, Norio, 4,351,052, Cl. 372-58.000.
Shiratori, Takahisa; Tamura, Masaru; and Hanada, Kouji, to Fujitsu Limited. Relay for printed circuit board. 4,350,856, Cl. 200-306.000.
Shirono, Junkichi; and Honda, Katsuhisa, to Anritsu Electric Company Limited. Test rack for electronic equipment. 4,350,098, Cl. 108-6.000.
Shishoo, Roshan, to Tex Innovation AB. Method for treating insulating fiber. 4,350,001, Cl. 53-431.000.
Shlepakov, Valery N.: *See*—
Pokhodnya, Igor K.; Shlepakov, Valery N.; Alter, Vladimir F.; Ovcharenko, Nikolai T.; Kaplienko, Igor P.; and Rak, Petr I., 4,350,311, Cl. 242-83.000.
Shotwell, Thomas K., to Farnam Companies, Inc. Insect trapping collar. 4,350,122, Cl. 119-106.000.
Shulman, Michael A., to Ford Motor Company. Air fuel mixture control system and method. 4,350,130, Cl. 123-440.000.

Siegel, Hardo: *See—*
Degner, Dieter; Pander, Hans J.; and Siegel, Hardo, 4,350,641, Cl. 260-465.00E.
Kastner, Gerhard; Siegel, Hardo; and Geiss, Karl-Heinz, 4,350,636, Cl. 549-435.000.
Siemens Aktiengesellschaft: *See—*
Bonu, Bonu, 4,350,562, Cl. 156-639.000.
Knauer, Karl, 4,350,902, Cl. 307-221.00D.
Montag, Bernhard; Mages, Gert; and Opitz, Heinrich, 4,350,757, Cl. 430-422.000.
von Tomkewitsch, Romuald, 4,350,970, Cl. 340-23.000.
Sigalos & Levine, P.C.: *See—*
Hall, Alfred E., 4,350,340, Cl. 273-153.00R.
Silver, Samuel. Shoe. 4,349,970, Cl. 36-3.00B.
Simeth, Claus, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Ink fountain on inking units of printing presses. 4,350,095, Cl. 101-365.000.
Simonsen, Karlo B.: *See—*
Busche, Alan C.; and Simonsen, Karlo B., 4,350,846, Cl. 179-1.00C.
Simroth, Donald W.: *See—*
Van Cleve, Russell; Armstrong, George H.; and Simroth, Donald W., 4,350,780, Cl. 521-137.000.
Singer Company, The: *See—*
Cook, Albert N., 4,350,104, Cl. 112-220.000.
Gdovin, David P., 4,350,489, Cl. 434-40.000.
Kreeley, Bruce K., 4,350,181, Cl. 137-614.000.
Siracusano, Elizabeth, to Albany International Corp. Novel yarn and fabric formed therefrom. 4,350,731, Cl. 428-234.000.
Siren, Matti J. Filter material. 4,350,173, Cl. 131-332.000.
Sistemas Naturales Internacionales, S.A., Sinatin, S.A.: *See—*
Ruiz de Palacios, Jose I., 4,350,708, Cl. 426-11.000.
Sivak, Michael V., Jr.; and Skipper, George J., to Cleveland Clinic Foundation. Esophageal varices injector. 4,350,148, Cl. 128-4.000.
SKF Kugellagerfabriken GmbH: *See—*
Schulz, Horst-Hermann; and Koneke, Johannes, 4,350,398, Cl. 308-216.000.
Skipper, George J.: *See—*
Sivak, Michael V., Jr.; and Skipper, George J., 4,350,148, Cl. 128-4.000.
Skoli, Sigmund P.; Kemp, David M.; and Mojonnier, Harry G., to FMC Corporation. Fluid flow metering device. 4,350,503, Cl. 55-165.000.
Slavin, James A., to Noltac Corp. Material processing apparatus. 4,350,429, Cl. 354-299.000.
Sloboda, Adolph E., to American Cyanamid Company. Combinations of agents which give enhanced anti-inflammatory activity. 4,350,689, Cl. 424-232.000.
Smale, Terence C.: *See—*
Dickinson, Kay H.; Smale, Terence C.; and Southgate, Robert, 4,350,703, Cl. 424-274.000.
SMH-Adrex: *See—*
Geney, Christian, 4,350,092, Cl. 101-99.000.
Smirnov, Boris A.: *See—*
Kolesov, Evgeny V.; Smirnov, Boris A.; Fedotov, Vladimir M.; and Lipovsky, Iosif L., 4,350,160, Cl. 128-334.00R.
Smith, David R.: *See—*
Matthews, Michael R.; Newman, David H.; Smith, David R.; and Steventon, Alan G., 4,350,960, Cl. 372-46.000.
Smith International, Inc.: *See—*
Fowler, John H., 4,350,346, Cl. 277-26.000.
Vezirian, Edward, 4,350,060, Cl. 76-108.00A.
Smith, J. Thomas, to GTE Laboratories Incorporated. Oxidation resistant silicon nitride containing rare earth oxide. 4,350,771, Cl. 501-97.000.
Smith, Raymond D.: *See—*
Dornbusch, Arthur H.; and Smith, Raymond D., 4,350,281, Cl. 229-38.000.
Smith, Stuart B., to Thermoset AG. Method of making a low-friability, thermosetting foam. 4,350,776, Cl. 521-110.000.
Smith, Thomas J., to TII Industries, Inc. Shorting cage for protector wells. 4,351,015, Cl. 361-119.000.
Smith, Thomas V., to United States of America, Army. Omni pull percussion firing mechanism. 4,350,075, Cl. 89-27.00R.
SmithKline Corporation: *See—*
Ali, Faida E.; and Gleason, John G., 4,350,685, Cl. 424-45.000.
Gleason, John G.; and Hill, David T., 4,350,698, Cl. 424-258.000.
Smithson, Harold R.: *See—*
Retallick, William B.; and Smithson, Harold R., 4,350,617, Cl. 252-477.00R.
Snider, H. Dean, Jr. Fence guard. 4,349,989, Cl. 47-33.000.
Snipes, Wallace: *See—*
Keith, Alec D.; and Snipes, Wallace, 4,350,707, Cl. 424-346.000.
Snitzer, Elias; and Bacon, James F., to United Technologies Corporation. Metallic solder composite bonding. 4,350,744, Cl. 428-630.000.
Socapex: *See—*
Seytre, Bruno; and Bricaud, Herve, 4,350,403, Cl. 339-91.00R.
Societa Italiana Brevetti: *See—*
Bianchini, Giuliano, 4,350,145, Cl. 126-434.000.
Societa Italiana Telecomunicazioni Stemens S.p.A.: *See—*
Meroni, Umberto, 4,350,948, Cl. 323-282.000.
Societe Anonyme de Telecommunications: *See—*
Chable, Yves A.; Lacroix, Serge; and Rault, Philippe M., 4,350,168, Cl. 128-736.000.
Societe Anonyme dite: MARS-ACTEL: *See—*
Yapoudjian, Claude; and Pochet, Roger, 4,350,405, Cl. 339-97.00P.
Societe Anonyme dite: Sea Tank Co.: *See—*
Sanchez, Pierre; and Vitalis, Andre, 4,350,014, Cl. 60-641.700.
Societe Brio, Societe Anonyme: *See—*
Rapayelian, Christian, 4,349,974, Cl. 40-156.000.
Societe Nationale Industrielle Aerospatiale: *See—*
Larribe, Andre, 4,350,485, Cl. 425-389.000.
Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See—*
Ginalski, Pierre; and Gagnebin, Pierre-Luc, 4,351,042, Cl. 368-188.000.
Soderholm, Arne, to S.E.G. Resistor A.B. Weigh-platform, resting on load measuring support points. 4,350,218, Cl. 177-255.000.
Sodex-Magister, Societe d'Exploitation des Brevets Neiman: *See—*
Neyret, Guy, 4,350,852, Cl. 200-42.00A.
Solar Unlimited, Inc.: *See—*
Bowden, Donald R., 4,349,950, Cl. 29-157.3AH.
Solo Kleinmotoren GmbH: *See—*
Kossek, Gunter; and Emmerich, Heinz, 4,350,123, Cl. 123-2.000.
Solomon, Jerry E.: *See—*
Geelhood, Bruce D.; Mastny, Gary F.; Solomon, Jerry E.; Wesley, Edward J.; Lindner, Elek; Dooley, Carol A.; and Lane, Sandra M., 4,350,890, Cl. 250-372.000.
Soncrant, Donald T., to Stellhorn Company, The. Fluidic type leak testing machine. 4,350,038, Cl. 73-49.200.
Sonetaka, Kazunori: *See—*
Nishino, Atsushi; Kimura, Kunio; Sonetaka, Kazunori; and Takeuchi, Yasuhiro, 4,350,613, Cl. 252-455.00R.
Sonnabend, Ferdinand: *See—*
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,349,948, Cl. 29-157.10R.
Sony Corporation: *See—*
Yoshida, Akihiro, 4,350,654, Cl. 264-129.000.
Soros, Paul. Self-unloading cargo vessel. 4,350,467, Cl. 414-144.000.
South Eastern Electricity Board: *See—*
Peddie, Robert A.; and Fielden, John S., 4,351,028, Cl. 364-483.000.
Southgate, Robert: *See—*
Dickinson, Kay H.; Smale, Terence C.; and Southgate, Robert, 4,350,703, Cl. 424-274.000.
Spainhour, Carroll D.: *See—*
Coucoulas, Alexander; and Spainhour, Carroll D., 4,350,513, Cl. 65-29.000.
Sparks, William D. Method and apparatus for producing an air/fuel vapor mixture. 4,350,134, Cl. 123-557.000.
Spatola, Joseph A. Method and apparatus for decontaminating gas vented from land fill and fugitive sources. 4,350,502, Cl. 55-74.000.
Spector, George: *See—*
Kocharian, Alfred; and Spector, George, 4,350,712, Cl. 426-134.000.
Spiegel, Raymond W.: *See—*
Dingler, Geoffrey L.; Jarvis, Wilbur W.; and Spiegel, Raymond W., 4,350,306, Cl. 241-46.150.
Spina-Trac AB: *See—*
Weiner, Hans, 4,350,388, Cl. 297-284.000.
Spinal Systems Inc.: *See—*
Schalkowsky, Samuel; and Whitley, Donald, 4,350,186, Cl. 141-83.000.
Spira, Joel S.; Luchaco, David G.; and Capewell, Dennis, to Lutron Electronics Co., Inc. Gas discharge lamp control. 4,350,935, Cl. 315-291.000.
Spire Corporation: *See—*
Little, Roger G., 4,350,561, Cl. 156-624.000.
Spires, Darrell J.: *See—*
Yargus, Lloyd A.; Switzer, Lester W., Sr.; Allen, Gary N.; Elliott, Gary S.; Yargus, Larry D.; Lowry, William D.; Gosnell, Jeffrey M.; and Spires, Darrell J., 4,350,444, Cl. 366-141.000.
Spraker, Philip W., to Sybron Corporation. Microbiological process for removing oleaginous material from wastewater and microbiological combination capable of same. 4,350,770, Cl. 435-253.000.
Spreadbury, Robert J., to Westinghouse Electric Corp. Discharge device ballast component which provides both voltage transformation and variable inductive reactance. 4,350,934, Cl. 315-282.000.
Sprecker, Mark A.: *See—*
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,350,733, Cl. 428-290.000.
Springer, Hartmut, to Hoechst Aktiengesellschaft. Water-soluble phthalocyanine compounds. 4,350,632, Cl. 260-314.500.
Spronck, Emmanuel S. M. Balancing device and foldable platform sideboard. 4,350,382, Cl. 296-38.000.
Square D Company: *See—*
Campbell, Paul K.; and Nichols, Edward L., III, 4,350,843, Cl. 174-94.00R.
Lass, John L., 4,350,839, Cl. 174-65.00G.
Srock, Rainer: *See—*
Kolb, Eugen; and Srock, Rainer, 4,350,367, Cl. 280-756.000.
Stabatrol Corporation: *See—*
Valiga, Richard E.; and Rosso, John R., 4,350,461, Cl. 405-128.000.
Stack, Eugene V.: *See—*
Burnett, Edward L.; and Stack, Eugene V., 4,350,653, Cl. 264-127.000.
Stadler, Paul; and Troxler, Franz, to Sandoz Ltd. N-Benzoyl-N'-3-indolyl-N'alkyl-1,3-diaminopropanes. 4,350,634, Cl. 260-326.13B.
Staedtler, J. S.: *See—*
Kimpel, Gunter, 4,350,787, Cl. 524-302.000.
Stahle, Kurt, to Concordia Fluidtechnik GmbH. Valve, especially a solenoid valve. 4,350,320, Cl. 251-129.000.
Stahlhuth, Paul H., to Ford Aerospace & Communications Corp. Electromagnetic clutch assembly. 4,350,236, Cl. 192-84.00C.

Stahlschmitt, Horst: *See*—
Albrecht, Ernst; Hensel, Reiner; Keller, Karl-Heinz; and Stahlschmitt, Horst, 4,350,105, Cl. 112-256.000.
Stammer, Charles H., to Research Corporation. Preparation of dehydropeptides. 4,350,628, Cl. 260-112.50R.
Standard Oil Company: *See*—
Kiikka, Oliver A.; and Day, Donald R., 4,351,056, Cl. 373-88.000.
Lemanski, Michael F.; Bremer, Noel J.; and Milberger, Ernest C., 4,350,611, Cl. 252-435.000.
Milberger, Ernest C.; Bremer, Noel J.; and Dria, Dennis E., 4,350,639, Cl. 549-259.000.
Standard Oil Company (Indiana): *See*—
Cyr, Stephen J.; Schubert, John C.; and Dehlinger, John, 4,350,730, Cl. 428-215.000.
Hall, Richard A.; and Bernier, Edward J., Jr., 4,350,742, Cl. 428-520.000.
Meguerian, Garbis H.; Lorntson, John M.; and Vasalos, Iacovos A., 4,350,615, Cl. 252-455.00Z.
Sharp, Shelby P.; and Yarborough, Lyman, 4,350,600, Cl. 252-8.55E.
Stanford Associates, Inc.: *See*—
Beckwith, John R., 4,350,144, Cl. 126-427.000.
Starkey, Stanley V.: *See*—
Hinchcliffe, Dennis; Starkey, Stanley V.; and Stone, William A., 4,350,242, Cl. 198-605.000.
Starr, Thomas J.: *See*—
Nelson, Richard E.; and Starr, Thomas J., 4,350,267, Cl. 222-131.000.
Stauffer Chemical Company: *See*—
Goswami, Jagadish C.; and Parikh, Shridhar V., 4,350,792, Cl. 525-129.000.
Greco, Carl C.; and Triplett, Kelly B., 4,350,612, Cl. 252-441.000.
Teach, Eugene G., 4,350,517, Cl. 71-88.000.
Steenblik, Richard A.; and Ho, Dar-Veig, to Georgia Tech Research Institute. Fresnel spiral reflector and method for making same. 4,350,412, Cl. 350-292.000.
Steibitz, Paul H.: *See*—
Avery, Stephen T.; Durbin, John A.; Lama, William L.; and Steibitz, Paul H., 4,351,019, Cl. 362-298.000.
Stein, Gunter: *See*—
Gay, Tom A.; Hartman, Gary L.; and Stein, Gunter, 4,351,027, Cl. 364-432.000.
Steineman, Robert J., to United Aircraft Products, Inc. Self fixturing heat exchanger. 4,350,201, Cl. 165-76.000.
Stellhorn Company, The: *See*—
Soncrant, Donald T., 4,350,038, Cl. 73-49.200.
Stengel, Frederick H.: *See*—
Schwartz, Henry D.; Krull, Irwin H.; Clement, Carl J.; Stengel, Frederick H.; and Hayslett, David D., 4,350,579, Cl. 204-195.00R.
Stepanov, Mikhail M.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Tsipenjuk, Yakov I.; Goldshtein, Boris G.; Lavnikov, Nikolai S.; Teres, Leonid N.; Urazhdin, Ivan I.; Yakubovsky, Petr S.; Boiko, Vitaly T.; Kalmykov, Anatoly M.; Minyashkin, Dmitry P.; and Stepanov, Mikhail M., 4,350,213, Cl. 173-93.600.
Stephenson, George M.; Begin, David L.; Casavant, Roger; Bornemeier, Stephen; and Colucci, William J., to Stephenson, George M. Remote delivery nozzle and pressurized container assembly. 4,350,299, Cl. 239-337.000.
Stephenson, Robert G., to James Howden Australia Pty. Limited. Air infiltration and mixing device. 4,350,100, Cl. 110-203.000.
Stephenson, Robert L.: *See*—
Frantom, Richard L.; Stephenson, Robert L.; and Thomas, Rudy V., 4,350,368, Cl. 280-804.000.
Sterling Drug Inc.: *See*—
Chowdhury, Ajit K., 4,350,599, Cl. 210-761.000.
Steuer, Herbert, to P.I.V. Antrieb Werner Reimers GmbH & Co. KG. Cone-pulley belt-type transmission. 4,350,491, Cl. 474-12.000.
Stevens, John; and Newman, Stephen, to Minnesota Mining and Manufacturing Company. Isopropylbenzene derivatives. 4,350,644, Cl. 260-501.150.
Steventon, Alan G.: *See*—
Matthews, Michael R.; Newman, David H.; Smith, David R.; and Steventon, Alan G., 4,350,960, Cl. 372-46.000.
Stewart, John L., to PPG Industries, Inc. Method of producing glass edge multiple glazed units. 4,350,515, Cl. 65-40.000.
Stewart, Robert D.; and Gamble, Robert L., to Foster Wheeler Energy Corporation. Fluidized bed reactor utilizing zonal fluidization and anti-mounding pipes. 4,349,969, Cl. 34-57.00A.
Stewart-Warner Corporation: *See*—
Fontana, Frank J., 4,349,937, Cl. 16-35.00R.
Fontana, Frank J., 4,349,938, Cl. 16-35.00R.
Stieger, Othmar, to Opprecht, Paul. Feeding device in a welding machine for feeding can bodies to electrode rolls. 4,350,862, Cl. 219-64.000.
Stinson Manufacturing Company: *See*—
Zenner, Dennis W.; and Jenkins, Jesse F., 4,350,357, Cl. 280-79.300.
Stog, Wilhelm, to WSW Stahl- und Wasserbau GmbH. Floating jet aerator. 4,350,589, Cl. 210-220.000.
Stone, Richard A.: *See*—
Laties, Alan M.; and Stone, Richard A., 4,350,676, Cl. 424-7.000.
Stone, William A.: *See*—
Hinchcliffe, Dennis; Starkey, Stanley V.; and Stone, William A., 4,350,242, Cl. 198-605.000.
Strakowski, Joseph. Back massage board. 4,350,152, Cl. 128-24.00R.
Strantz, Ralph M., to Lund Lures, Inc. Bait fish holder. 4,349,979, Cl. 43-44.800.
Strathmann, Heinrich: *See*—
Schmoldt, Harm; Kock, Klaus; and Strathmann, Heinrich, 4,350,581, Cl. 204-301.000.
Straub, Ferdinand; Lang, Siegfried; and Roske, Eckhard, to BASF Aktiengesellschaft. Vinylpyrrolidone polymers, their preparation, their use in the preparation of plasma substitutes, and the substitutes thus obtained. 4,350,791, Cl. 525-123.000.
Strauch, George E., Jr., to Power Controls Corporation. Variable control circuit having a timed bypass. 4,350,944, Cl. 318-779.000.
Strauts, Eric J.: *See*—
Flaherty, John J.; Strauts, Eric J.; Wagerer, Helmut F.; and Loose, Timothy C., 4,351,031, Cl. 364-580.000.
Striese, Jim G., to TRW Inc. Medical electrode assembly. 4,350,165, Cl. 128-640.000.
Strobel, John M.: *See*—
Nezworski, James E.; and Strobel, John M., 4,350,273, Cl. 222-400.800.
Strojosvit: *See*—
Janirek, Ladislav; Hlavinka, Jaroslav; Hanacek, Josef; and Miculka, Zdenek, 4,350,029, Cl. 69-1.000.
Strong Electric Corporation: *See*—
Freeman, Robert S., 4,350,417, Cl. 353-90.000.
Struth, Helmut: *See*—
Gupte, Arun R.; Kladders, Heinrich; and Struth, Helmut, 4,350,049, Cl. 73-864.510.
Sturm, Budd H.: *See*—
Hopper, Roger J.; Sturm, Budd H.; and Geiser, Joseph F., 4,350,818, Cl. 548-166.000.
Sturzinger, Oskar E.; and Frutiger, Peter, to Anstalt Europaische Handelsgesellschaft. Encipering- and deciphering apparatus in the form of a typewriter. 4,350,844, Cl. 178-22.180.
Suga, Masaaki; and Hamada, Hideo, to Nissan Motor Co., Ltd. Automatic transmission system provided with a function of engine brake. 4,350,234, Cl. 192-4.00A.
Sugawara, Hiroyuki: *See*—
Sasaki, Kouji; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Takemori, Satoshi; and Ikemoto, Norio, 4,351,052, Cl. 372-58.000.
Sugimoto, Hitoshi: *See*—
Kubota, Yutaka; and Sugimoto, Hitoshi, 4,350,876, Cl. 219-497.000.
Sugimura, Takaaki; Ozawa, Yutaka; and Takahashi, Mari, to Nippon Zeon Co. Ltd. Peel-up type adhesives. 4,350,723, Cl. 428-42.000.
Sugiura, Yutaka: *See*—
Araki, Ken; Sakai, Hiromitsu; and Sugiura, Yutaka, 4,350,717, Cl. 427-8.000.
Sugiyama, Matsuyoshi; Morishita, Teru; and Suzuki, Toshikazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary type electrostatic spray painting device. 4,350,304, Cl. 239-703.000.
Sullivan, Bruce M.: *See*—
Alseth, Steven M.; and Sullivan, Bruce M., 4,350,509, Cl. 55-337.000.
Sumitomo Chemical Company, Limited: *See*—
Baba, Kazuo; Wakatsuki, Kizuku; and Hikasa, Tadashi, 4,350,802, Cl. 526-142.000.
Summo, Arthur M., to Branson Ultrasonics Corporation. Method for closing an end of a thermoplastic tube using ultrasonic energy. 4,350,649, Cl. 264-23.000.
Sundermann, Erich, to Perfluktiv-Consult AG. Method and an apparatus for the manufacture of baked products, especially bread. 4,350,710, Cl. 426-19.000.
Sunds Defibrator Aktiebolag: *See*—
Lundgren, Rolf B., 4,350,499, Cl. 55-1.000.
Superior Electric Company, The: *See*—
Lundin, Robert S., 4,349,957, Cl. 29-596.000.
Sutoh, Shinji; Harada, Takeshi; and Kaneko, Shinichi, to Diesel Kiki Company, Ltd. Humidity control apparatus. 4,350,286, Cl. 236-44.00A.
Suzuki, Hideo; and Kaneko, Makoto, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with tone production channel groups. 4,350,068, Cl. 84-1.010.
Suzuki, Koichi: *See*—
Suzuki, Shigeru; Suzuki, Minoru; Suzuki, Koichi; Omi, Kyoji; Nagahara, Yasumori; Kagari, Yoshiharu; Hashimoto, Makoto; and Mori, Goro, 4,350,750, Cl. 430-125.000.
Suzuki, Masayoshi: *See*—
Sagae, Syoji; Matsuda, Yasumasa; Kasahara, Masatoshi; and Suzuki, Masayoshi, 4,350,989, Cl. 346-140.00R.
Suzuki, Minoru: *See*—
Suzuki, Shigeru; Suzuki, Minoru; Suzuki, Koichi; Omi, Kyoji; Nagahara, Yasumori; Kagari, Yoshiharu; Hashimoto, Makoto; and Mori, Goro, 4,350,750, Cl. 430-125.000.
Suzuki, Naoyoshi: *See*—
Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, 4,350,289, Cl. 237-12.30A.
Suzuki, Shigeru; Suzuki, Minoru; Suzuki, Koichi; Omi, Kyoji; Nagahara, Yasumori; Kagari, Yoshiharu; Hashimoto, Makoto; and Mori, Goro, to Ricoh Company, Ltd. Electrophotographic process. 4,350,750, Cl. 430-125.000.
Suzuki, Shuichi; and Karube, Isao, to Ajinomoto Company, Inc. Method for determining biochemical oxygen demand. 4,350,763, Cl. 435-29.000.
Suzuki, Tadashi: *See*—
Kishi, Norimasa; and Suzuki, Tadashi, 4,350,057, Cl. 74-866.000.

Suzuki, Toshiaki: *See—*
Kato, Matsuo; Ohtsuki, Tomonari; Igarashi, Yoshiaki; Saito, Tsukasa; and Suzuki, Toshiaki, 4,350,409, Cl. 339-186.00M.

Suzuki, Toshikazu: *See—*
Sugiyama, Matsuyoshi; Morishita, Teru; and Suzuki, Toshikazu, 4,350,304, Cl. 239-703.000.

Suzuki, Yuji: *See—*
Itagaki, Hidehiko; and Suzuki, Yuji, 4,349,962, Cl. 30-276.000.

Suzuta, Mikio: *See—*
Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; Tsunoda, Atsuo; Midorikawa, Koyo; Murase, Hidetoshi; Suzuta, Mikio; and Moriwaki, Masazumi, 4,350,431, Cl. 355-1.000.

Swindell, David F.: *See—*
Forrester, John S.; Swindell, David F.; and Wildsmith, Michael A., 4,350,971, Cl. 340-52.00R.

Swithenbank, Colin: *See—*
Bayer, Horst O.; and Swithenbank, Colin, 4,350,522, Cl. 71-111.000.

Switzer, Lester W., Sr.: *See—*
Yargus, Lloyd A.; Switzer, Lester W., Sr.; Allen, Gary N.; Elliott, Gary S.; Yargus, Larry D.; Lowry, William D.; Gosnell, Jeffrey M.; and Spires, Darrell J., 4,350,444, Cl. 366-141.000.

Sybron Corporation: *See—*
Spraker, Philip W., 4,350,770, Cl. 435-253.000.

Syrier, Johannes L. M., to Shell Oil Company. 3,6,6-Trimethylbicyclo[3.1.0]hexane derivatives as pyrethroid intermediates. 4,350,820, Cl. 549-545.000.

Syrier, Johannes L. M., to Shell Oil Company. 3,6,6-Trimethylbicyclo[3.1.0]hexane derivatives as pyrethroid intermediates. 4,350,821, Cl. 549-545.000.

Szymczak, Thaddeus J.: *See—*
Astfalk, Gregory; Fowler, Lawrence A.; Herring, Chauncey, Jr.; and Szymczak, Thaddeus J., 4,351,030, Cl. 364-552.000.

T.B.C. Pty. Limited: *See—*
Hill, Ian L., 4,350,962, Cl. 332-60.000.

Tada, Tetsuya, to Canyon Corporation. Foam dispenser. 4,350,298, Cl. 239-333.000.

Taglieber, Volker: *See—*
Kummer, Rudolf; Taglieber, Volker; Weis, Franz-Josef; and Schneider, Heinz-Walter, 4,350,572, Cl. 203-35.000.

Taguchi, Kazumasa; Isako, Hiroshi; Ikeda, Koichi; Honda, Keisuke; Kanemoto, Masaru; and Hanaoka, Keishiro, to Kabushiki Kaisha Kobe Seiko Sho. Porous iron ore pellets. 4,350,523, Cl. 75-0.50R.

Taguchi, Tetsuya; Tamura, Shuichi; Tokuda, Ryuji; and Ogawa, Masahiko, to Canon Kabushiki Kaisha. Camera provided with automatic focus adjusting device. 4,350,418, Cl. 354-25.000.

Taiho Pharmaceutical Company, Limited: *See—*
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,350,700, Cl. 424-263.000.

Takada, Juichiro. Belt shifting mechanism for a passive vehicle restraint belt system. 4,350,370, Cl. 280-804.000.

Takada, Tadakazu; Tokitomo, Kazuo; and Hoshino, Hitoshi, to Fujitsu Limited. Dry etching of metal film. 4,350,563, Cl. 156-643.000.

Takagi, Masaharu; and Nishida, Yoshinori, to Matsushita Electric Industrial Co., Ltd. Follow-up control apparatus for controlling the movement of a welding weaving device. 4,350,868, Cl. 219-137.00R.

Takahashi, Kenji; and Miyahara, Junji, to Fuji Photo Film Co., Ltd. Radiation image storage panel. 4,350,893, Cl. 250-484.100.

Takahashi, Mari: *See—*
Sugimura, Takaaki; Ozawa, Yutaka; and Takahashi, Mari, 4,350,723, Cl. 428-42.000.

Takahashi, Masaki: *See—*
Uenosono, Chikasa; Okada, Takao; Matsuki, Junya; Naito, Tadashi; Inoue, Shinichiro; and Takahashi, Masaki, 4,350,947, Cl. 322-17.000.

Takahashi, Yosuke; Akasaka, Hideki; Kasui, Toshikatsu; and Niwa, Tatsuo, to Nippon Kogaku K. K. All solid state electrochromic device. 4,350,414, Cl. 350-357.000.

Takano, Takao: *See—*
Nagai, Shosuke; Kato, Toshio; Iguchi, Chojiro H.; Kawashima, Nobuyuki; Mita, Ryuichi; Yamaguchi, Akihiro; and Takano, Takao, 4,350,643, Cl. 260-465.700.

Takasugi, Hisashi: *See—*
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tozuka, Zenzaburo, 4,350,693, Cl. 424-246.000.

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Takeda, Akitsu: *See—*
Mizushima, Yoshihiko; Takeda, Akitsu; Yoshikawa, Akira; Ochi, Osamu; and Hisaki, Tomoko, 4,350,541, Cl. 148-188.000.

Takei, Hirofumi, to Nissan Motor Co., Ltd. Silencer. 4,350,223, Cl. 181-229.000.

Takei, Yukio; Yoshida, Masao; and Nishizawa, Rinzo, to Nippon Kayaku Kabushiki Kaisha. Process for producing 7-alkoxycarbonyl-6,8-dimethyl-4-hydroxymethyl-1-phthalazone and its intermediates. 4,350,813, Cl. 544-237.000.

Takemori, Satoshi: *See—*
Sasaki, Kouji; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Takemori, Satoshi; and Ikemoto, Norio, 4,351,052, Cl. 372-58.000.

Takemura, Yukio: *See—*
Seto, Susumu; Tokuhara, Mitsuhiro; Takemura, Yukio; Yamada, Yu; and Kuwayama, Takeshi, 4,350,433, Cl. 355-8.000.

Takeno, Hidekazu: *See—*
Hashimoto, Misashi; Hemmi, Keiji; Aratari, Matsuhiko; Takeno, Hidekazu; and Hagiwara, Daijiro, 4,350,694, Cl. 424-248.540.

Takeuchi, Hiroo, to Nissin Kogyo Kabushiki Kaisha. Differential pressure operated servo boosters. 4,350,077, Cl. 91-376.00R.

Takeuchi, Tsuneto: *See—*
Miyazaki, Kiyoshi; Takeuchi, Tsuneto; Ito, Jinichi; and Ashibe, Hiroo, 4,350,937, Cl. 318-331.000.

Takeuchi, Yasuhiro: *See—*
Nishino, Atsushi; Kimura, Kunio; Sonetaka, Kazunori; and Takeuchi, Yasuhiro, 4,350,613, Cl. 252-455.00R.

Takikawa, Katsuo: *See—*
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,350,700, Cl. 424-263.000.

Takizawa, Tastuo: *See—*
Nakayama, Shigeru; and Takizawa, Tastuo, 4,350,870, Cl. 219-216.000.

Talbot, Dean W., to General Electric Company. Mine bolt composition. 4,350,783, Cl. 523-505.000.

Talon, Inc.: *See—*
Moertel, George B., 4,349,943, Cl. 24-205.13R.
Moertel, George B., 4,350,656, Cl. 264-166.000.

Tamura, Masaru: *See—*
Shiratori, Takahisa; Tamura, Masaru; and Hanada, Kouji, 4,350,856, Cl. 200-306.000.

Tamura, Shuichi: *See—*
Taguchi, Tetsuya; Tamura, Shuichi; Tokuda, Ryuji; and Ogawa, Masahiko, 4,350,418, Cl. 354-25.000.

Tanabe Seiyaku Co., Ltd.: *See—*
Chibata, Ichiro; Kato, Jyoji; and Wada, Mitsuru, 4,350,765, Cl. 435-161.000.

Tanaka, Hiroaki; and Akita, Sigeyuki, to Nippon Soken, Inc. Capacitive rotational position detector. 4,350,981, Cl. 340-870.370.

Tanaka, Kiyoaki: *See—*
Fujii, Hiroo; Tanaka, Kiyoaki; Nakamura, Masashi; Okuno, Ryuzo; Hashizume, Shigeyuki; Katayama, Hideo; and Fujita, Tsutomu, 4,350,326, Cl. 266-201.000.

Tanaka, Toshie; and Yuda, Takuo, to Nifco Inc. Molding clip assemblage. 4,349,993, Cl. 52-208.000.

Tanioka, Hiroshi; Ishida, Masato; and Inuzuka, Tsuneki, to Canon Kabushiki Kaisha. Copying apparatus. 4,350,439, Cl. 355-14.0SH.

Taper Line, Inc.: *See—*
Keen, Ralph O., 4,349,955, Cl. 29-526.00R.

Tashlick, Irving: *See—*
Corea, John E.; Corea, Emanuel R.; and Tashlick, Irving, 4,350,481, Cl. 425-73.000.

Tattersall, John C., to Olympic Power Winches Limited. Winding arrangements. 4,350,109, Cl. 114-105.000.

Teach, Eugene G., to Stauffer Chemical Company. Hydroxyacetyl oxaxolidine herbicidal antidotes. 4,350,517, Cl. 71-88.000.

Teche, Andre: *See—*
Martel, Jacques; Tessier, Jean; and Teche, Andre, 4,350,637, Cl. 549-304.000.

Technical Irrigation Products, Inc.: *See—*
Kuhlman, Ora F.; and Tobey, Samuel, 4,350,296, Cl. 239-201.000.

Tecumseh Products Company: *See—*
Gannaway, Edwin L., 4,350,083, Cl. 92-238.000.

Teich, Wesley W.: *See—*
Dudley, Kenneth W.; Teich, Wesley W.; and Bowen, Robert F., 4,350,859, Cl. 219-10.55F.

Teijin Limited: *See—*
Masuho, Yasuhiko; and Hara, Takeshi, 4,350,626, Cl. 260-112.50R.

Telefonaktiebolaget L M Ericsson: *See—*
Hedin, Jan S.; and Jarnestedt, Goran A., 4,351,061, Cl. 375-20.000.

Tellabs, Inc.: *See—*
Chambers, Charles W., Jr., 4,350,964, Cl. 333-213.000.

Teraji, Tsutomu: *See—*
Kamiya, Takashi; and Teraji, Tsutomu, 4,350,692, Cl. 424-246.000.

Teres, Leonid N.: *See—*
Antipov, Georgy A.; Gelfand, Mikhail L.; Tsipenjuk, Yakov I.; Goldshtein, Boris G.; Lavnikov, Nikolai S.; Teres, Leonid N.; Urazhdin, Ivan I.; Yakubovsky, Petr S.; Boiko, Vitaly T.; Kalmykov, Anatoly M.; Minyashkin, Dmitry P.; and Stepanov, Mikhail M., 4,350,213, Cl. 173-93.600.

Terouanne, Beatrice: *See—*
Nicolas, Jean-Claude; Terouanne, Beatrice; Descomps, Bernard; and Crastes de Paulet, Andre, 4,350,760, Cl. 435-7.000.

Tessier, Jean: *See—*
Martel, Jacques; Tessier, Jean; and Teche, Andre, 4,350,637, Cl. 549-304.000.

Tetsu, Junichi: *See—*
Akiyama, Masatoshi; Kitamura, Shigeki; Tetsu, Junichi; and Nakazato, Koichi, 4,350,514, Cl. 65-36.000.

Teverovsky, Alex: *See—*
Helgeland, Walter; Teverovsky, Alex; Kerwin, Kenneth H., II; and Chartier, Carl P., 4,350,560, Cl. 156-617.0SP.

Tex Innovation AB: *See—*
Shishoo, Roshan, 4,350,001, Cl. 53-431.000.

Texaco Inc.: *See—*
Dominguez, Richard J. G.; Rice, Doris M.; and Zimmerman, Robert L., 4,350,778, Cl. 521-118.000.
Dominguez, Richard J. G.; and McCoy, David R., 4,350,779, Cl. 521-126.000.
Widmyer, Richard H., 4,350,203, Cl. 166-51.000.

Texas Instruments Incorporated: *See*—
Choate, William C.; and Ho, David S., 4,351,004, Cl. 358-213.000.
Doherty, John, Jr., 4,350,967, Cl. 337-343.000.
Tubbs, Graham S., 4,350,992, Cl. 357-23.000.
Teyssier, Lucien: *See*—
Couennault, Pierre; and Teyssier, Lucien, 4,350,928, Cl. 315-39.300.
Thermoset AG: *See*—
Smith, Stuart B., 4,350,776, Cl. 521-110.000.
Theysohn, Rainer; Boehlke, Klaus; Seiler, Erhard; and Welz, Martin, to BASF Aktiengesellschaft. Manufacture of electrically conductive polyolefin moldings, and their use. 4,350,652, Cl. 264-104.000.
Thiel, Rudolf, to ITT Industries, Inc. Vacuum brake booster. 4,350,076, Cl. 91-369.00A.
Thierrichter, Burkhard: *See*—
Junek, Hans; and Thierrichter, Burkhard, 4,350,815, Cl. 546-115.000.
Junek, Hans; and Thierrichter, Burkhard, 4,350,816, Cl. 546-116.000.
Thomas, Ernest D. R., to British Aerospace. Ramp for aircraft take-off. 4,350,316, Cl. 244-63.000.
Thomas, Rudy V.: *See*—
Frantom, Richard L.; Stephenson, Robert L.; and Thomas, Rudy V., 4,350,368, Cl. 280-804.000.
Thompson, Albert N. Curling push-broom. 4,349,933, Cl. 15-118.000.
Thompson, C. Keith. Interstitial gas probe. 4,350,051, Cl. 73-864.740.
Thompson, Howard J., to Medtronic, Inc. Body implantable medical infusion system. 4,350,155, Cl. 128-213.00R.
Thomson-Brandt: *See*—
Rouget, Jean P.; and Roustant, Edmond, 4,350,074, Cl. 89-1.50D.
Thomson-CSF: *See*—
Benoit-Gonin, Roger; Berger, Jean L.; and Coutures, Jean L., 4,350,976, Cl. 340-347.0DA.
Couennault, Pierre; and Teyssier, Lucien, 4,350,928, Cl. 315-39.300.
Morell, Antoinette; and Hermosin, Antonio, 4,350,651, Cl. 264-65.000.
Thorington, Luke: *See*—
Trutner, Donald G.; and Thorington, Luke, 4,350,722, Cl. 428-35.000.
Thyssen Aktiengesellschaft: *See*—
Forch, Karl, 4,350,525, Cl. 75-124.000.
Thyssen Industrie AG: *See*—
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,349,948, Cl. 29-157.10R.
Tieszen, Dale O.; and Scoggins, Lacey E., to Phillips Petroleum Company. Preparation of branched chain arylene sulfide polymer. 4,350,810, Cl. 528-388.000.
Tihon, Claude; and Curry, M. E., to Bristol Myers Company. Method for preparing single cell suspension. 4,350,768, Cl. 435-241.000.
TII Industries Inc.: *See*—
Ahuja, Omprakash G., 4,350,849, Cl. 179-175.000.
Smith, Thomas J., 4,351,015, Cl. 361-119.000.
Tillmann, Horst, to Dorma-Baubeschlag GmbH & Co. KG. Automatic door closer. 4,349,939, Cl. 16-53.000.
Tjurin, Jury G.: *See*—
Khutoretsky, Garry M.; Tjurin, Jury G.; Drozdova, Larisa A.; and Belova, Tamara N., 4,350,910, Cl. 310-64.000.
Tobey, Samuel: *See*—
Kuhlman, Ora F.; and Tobey, Samuel, 4,350,296, Cl. 239-201.000.
Tojo, Kenji; Ikegawa, Masato; Shiibayashi, Masao; and Imai, Masaya, to Hitachi, Ltd. Scrool-type fluid machine with liquid-filled force-balanced pockets. 4,350,479, Cl. 418-55.000.
Tokarz, Richard D., to United States of America, Energy. Liquid level detector. 4,350,968, Cl. 338-13.000.
Tokarzewski, Richard J.: *See*—
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,350,733, Cl. 428-290.000.
Tokico Ltd.: *See*—
Ito, Hiroshi; and Saito, Kazuo, 4,350,229, Cl. 188-73.450.
Tokitomo, Kazuo: *See*—
Takada, Tadakazu; Tokitomo, Kazuo; and Hoshino, Hitoshi, 4,350,563, Cl. 156-643.000.
Tokuda, Ryuji: *See*—
Taguchi, Tetsuya; Tamura, Shuichi; Tokuda, Ryuji; and Ogawa, Masahiko, 4,350,418, Cl. 354-25.000.
Tokuhara, Mitsuhiro: *See*—
Seto, Susumu; Tokuhara, Mitsuhiro; Takemura, Yukio; Yamada, Yu; and Kuwayama, Takeshi, 4,350,433, Cl. 355-8.000.
Tokumatsu, Hiromu, to Sanyo Electric Co., Ltd. Clock generator in PCM signal reproducing apparatus. 4,351,000, Cl. 358-158.000.
Tokyo Electric Co., Ltd.: *See*—
Uchimura, Mitsuo; Oana, Masao; and Nishimura, Yoshiharu, 4,351,033, Cl. 364-900.000.
Tokyo Gas Co., Ltd.: *See*—
Zenbayashi, Katsuaki; Morinaga, Akio; Hirayama, Masao; and Morita, Akira, 4,350,548, Cl. 156-156.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Kuwabara, Eiji; Sakata, Takayoshi; Kawauchi, Noboru; Ide, Yuuichi; and Matsuo, Takeshi, 4,350,023, Cl. 62-176.00E.
Nakano, Hirotaka; and Yano, Kensaku, 4,350,729, Cl. 428-209.000.
Sato, Yasushi, 4,350,905, Cl. 307-451.000.
Tomizawa, Akimori: *See*—
Kariya, Masatane; and Tomizawa, Akimori, 4,350,848, Cl. 179-2.0DP.
Tomizawa, Yoshio: *See*—
Osada, Hajime; Kimura, Akiteru; Shimizu, Tokuo; Kitajima, Goro; Tomizawa, Yoshio; Kondo, Makoto; Motoyama, Kazuyasu; and Daigaku, Masaaki, 4,351,009, Cl. 360-105.000.
Tong, George K. K., to Tung Ming Electrical Co. Ltd.; and Chane Hwa Manufacturing Co. Ltd. Safety lamp plug. 4,350,407, Cl. 339-113.00L.
Toray Industries, Inc.: *See*—
Okamoto, Miyoshi; Watanabe, Koji; Nukushina, Yasuhiko; and Aizawa, Tsuneo, 4,350,006, Cl. 57-250.000.
Torok, Theodore E.; Shin, Paik W.; and Borzillo, Angelo R., to Bethlehem Steel Corporation. Method of improving the ductility of the coating of an aluminum-zinc alloy coated ferrous product. 4,350,539, Cl. 148-31.500.
Torrington Company, The: *See*—
Cornish, Paul M.; and Condon, Charles E., Jr., 4,350,397, Cl. 308-212.000.
Toscano, Robert J.: *See*—
Charles, Joel M.; and Toscano, Robert J., 4,350,323, Cl. 254-273.000.
Tottori, Takafumi: *See*—
Hanada, Yoshihiro; and Tottori, Takafumi, 4,350,269, Cl. 222-227.000.
Towers, Richard R.: *See*—
Blackwell, Jennings P.; and Towers, Richard R., 4,350,786, Cl. 524-263.000.
Townsend, Herbert E.: *See*—
Allegra, Louis K.; Townsend, Herbert E.; and Borzillo, Angelo R., 4,350,540, Cl. 148-31.500.
Townshend, James M. Tracking error measurement. 4,351,045, Cl. 369-55.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Kaneko, Shunji, 4,350,262, Cl. 220-273.000.
Toyo Tanso Co., Ltd.: *See*—
Watanabe, Nobuatsu; Kondo, Teruhisa; and Ishiguro, Jiro, 4,350,576, Cl. 204-101.000.
Toyokuni, Ryo, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece. 4,350,961, Cl. 331-158.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kanda, Mutsumi; Nakanishi, Kiyoshi; and Inoue, Tokuta, 4,350,125, Cl. 123-261.000.
Kawata, Shoji; Hattori, Kyo; and Sakurai, Kazuhiro, 4,350,319, Cl. 251-65.000.
Kiuchi, Hideo; and Kobayashi, Nobuyuki, 4,350,131, Cl. 123-453.000.
Sugiyama, Matsuyoshi; Morishita, Teru; and Suzuki, Toshikazu, 4,350,304, Cl. 239-703.000.
Tozuka, Zenzaburo: *See*—
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tozuka, Zenzaburo, 4,350,693, Cl. 424-246.000.
TP Laboratories, Inc.: *See*—
Kesling, Peter C.; and Henderlong, Dennis B., 4,350,487, Cl. 433-14.000.
Tran, Thanh G. Fruit picker. 4,350,005, Cl. 56-340.000.
Transidyne General Corporation: *See*—
Sarrine, Robert J., 4,350,147, Cl. 128-4.000.
Treiber, Robert, to International Telephone and Telegraph Corporation. Automatic, digitally synthesized matching line terminating impedance. 4,351,060, Cl. 375-12.000.
Trimble, Daniel W.: *See*—
United States of America, National Aeronautics and Space Administration; Dolland, Carlisle R.; and Trimble, Daniel W., 4,351,022, Cl. 363-87.000.
Trio Kabushiki Kaisha: *See*—
Miyamoto, Yukihiko, 4,350,957, Cl. 329-107.000.
Triplett, Kelly B.: *See*—
Greco, Carl C.; and Triplett, Kelly B., 4,350,612, Cl. 252-441.000.
Trotter, Jimmy R.: *See*—
McConnell, Richard L.; Trotter, Jimmy R.; and Jones, Glenn C., 4,350,807, Cl. 528-302.000.
McConnell, Richard L.; Trotter, Jimmy R.; and Jones, Glenn C., 4,350,808, Cl. 528-302.000.
Troxler, Franz: *See*—
Stadler, Paul; and Troxler, Franz, 4,350,634, Cl. 260-326.13B.
Trusselle, William H.; and Gustafson, John A., Jr., to Pneumatic Scale Corporation. Filling machine. 4,350,187, Cl. 141-90.000.
Trutner, Donald G.; and Thorington, Luke, to Duro-Test Corporation. Hollow glass article with improved optical finish. 4,350,722, Cl. 428-35.000.
TRW Inc.: *See*—
Engle, Edgar W., 4,350,528, Cl. 75-203.000.
Striese, Jim G., 4,350,165, Cl. 128-640.000.
Tsimerman, Alexandr B.: *See*—
Maisotsenko, Valery S.; Tsimerman, Alexandr B.; and Zexer, Mikhail G., 4,350,570, Cl. 203-10.000.
Tsipenjuk, Yakov I.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Tsipenjuk, Yakov I.; Goldshtein, Boris G.; Lavnikov, Nikolai S.; Teres, Leonid N.; Urazhdin, Ivan I.; Yakubovsky, Petr S.; Boiko, Vitaly T.; Kalmykov, Anatoly M.; Minyashkin, Dmitry P.; and Stepanov, Mikhail M., 4,350,213, Cl. 173-93.600.
Tsubota, Junjiro. Biological fermentation device. 4,350,588, Cl. 210-208.000.
Tsuiki, Tadanobu, to Cosmos Company Limited. Coin assorting device for a vending machine. 4,350,239, Cl. 194-1.00G.

Tsuji, Seizou: *See—*
Imanaka, Ryoichi; and Tsuji, Seizou, 4,351,044, Cl. 369-43.000.
Tsujimoto, Eiichi; Hirahara, Hiroshi; and Matsumoto, Makoto, to Kawasaki Steel Corporation. Merchandise delivery conveyor for automatic bagging apparatus. 4,350,004, Cl. 53-570.000.
Tsukuda Co., Ltd.: *See—*
Tsukuda, Mitsuo, 4,349,986, Cl. 46-254.000.
Tsukuda, Mitsuo, to Tsukuda Co., Ltd. Radio-controlled toys. 4,349,986, Cl. 46-254.000.
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Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; Tsunoda, Atsuo; Midorikawa, Koyo; Murase, Hidetoshi; Suzuta, Mikio; and Moriwaki, Masazumi, 4,350,431, Cl. 355-1.000.
Tubbs, Graham S., to Texas Instruments Incorporated. N-Channel silicon gate virtual ground ROM. 4,350,992, Cl. 357-23.000.
Tully, Wilfred R.: *See—*
Westwood, Robert; Tully, Wilfred R.; and Murdoch, Robert, 4,350,695, Cl. 424-251.000.
Tung Ming Electrical Co. Ltd.: *See—*
Tong, George K. K., 4,350,407, Cl. 339-113.00L.
Turk, Harold L.: *See—*
Grandia, Johannes; McChesney, William G.; Santini, Hugo A. E.; and Turk, Harold L., 4,350,116, Cl. 118-500.000.
Tyree, Lewis, Jr. Cryogenic refrigeration apparatus. 4,350,027, Cl. 62-374.000.
Uchimura, Mitsuo; Oana, Masao; and Nishimura, Yoshiharu, to Tokyo Electric Co., Ltd. Postal charge processing system wherein postal condition data is saved and reused for the next postal parcel. 4,351,033, Cl. 364-900.000.
Ueda, Hiroshi; and Oyokota, Shigeru, to Minolta Camera Kabushiki Kaisha. Camera with a built-in winder. 4,350,421, Cl. 354-152.000.
Ueda, Shigeki, to Matsushita Electric Industrial Co., Ltd. Heating apparatus with sensor. 4,350,860, Cl. 219-10.55B.
Uenosono, Chikasa; Okada, Takao; Matsuki, Junya; Naito, Tadashi; Inoue, Shinichiro; and Takahashi, Masaki, to Fuji Electric Co. Ltd.; and Takahashi, Masaki. System for predicting desynchronization of a synchronous machine. 4,350,947, Cl. 322-17.000.
Uhl, Guenter: *See—*
Distler, Harry; Widder, Rudi; and Uhl, Guenter, 4,350,531, Cl. 106-19.000.
UMC Industries, Inc.: *See—*
Shah, Hasmukh R.; Jones, Thaddeus M.; and Hemingway, Bruce, 4,350,238, Cl. 194-1.00N.
Union Carbide Corporation: *See—*
Alberto, Vicente S. D., 4,350,747, Cl. 429-184.000.
Fuderer, Andrija, 4,350,583, Cl. 208-310.00Z.
Jones, David N.; Burnett, Archibald L; and Miller, John C., 4,350,657, Cl. 264-349.000.
Van Cleve, Russell; Armstrong, George H.; and Simroth, Donald W., 4,350,780, Cl. 521-137.000.
United Aircraft Products, Inc.: *See—*
Steineman, Robert J., 4,350,201, Cl. 165-76.000.
United Kingdom Atomic Energy Authority: *See—*
Clough, Peter; and Walker, Donald C. B., deceased, 4,351,006, Cl. 360-9.000.
United States Gypsum Company: *See—*
Galer, Richard E.; Blasius, John R.; and Webb, Paul C., 4,350,533, Cl. 106-89.000.
Reily, William S., 4,350,736, Cl. 428-341.000.
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Air Force: *See—*
Davis, Steven J.; and Rapagnani, Nazareno L., 4,350,661, Cl. 422-98.000.
Jones, Carmen B., 4,350,043, Cl. 73-579.000.
Williamson, Tommy L., 4,350,443, Cl. 356-358.000.
Army: *See—*
Pollin, Irvin, 4,350,315, Cl. 244-3.230.
Shelton, Joe, 4,350,926, Cl. 313-455.000.
Smith, Thomas V., 4,350,075, Cl. 89-27.00R.
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Barnard, Ralston W.; and Jensen, Dal H., 4,350,887, Cl. 250-265.000.
Crouthamel, Marvin S.; and Coyle, Peter J., 4,350,836, Cl. 136-244.000.
Fasching, George E.; and Utt, Carroll E., 4,350,040, Cl. 73-304.00C.
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Banks, Bruce A., 4,349,954, Cl. 29-458.000.
McDonald, Glen E., 4,350,574, Cl. 204-56.00R.
Minott, Peter O., 4,350,410, Cl. 350-170.000.
National Security Agency: *See—*
Fisher, Robert H., 4,350,984, Cl. 343-112.00R.
Navy: *See—*
Alpers, Frederick C., 4,350,982, Cl. 343-6.80R.
Bottka, Nicholas; and Lessoff, Howard, 4,350,413, Cl. 350-356.000.
Buckley, William H., 4,350,233, Cl. 188-378.000.
Dowgul, Ronald W.; and Noble, Glendle W., 4,350,662, Cl. 422-122.000.
Geelhood, Bruce D.; Mastny, Gary F.; Solomon, Jerry E.; Wesley, Edward J.; Lindner, Elek; Dooley, Carol A.; and Lane, Sandra M., 4,350,890, Cl. 250-372.000.
Huang, Shih L.; McQuillen, Edward J.; and Richey, Robert J., Jr., 4,350,728, Cl. 428-105.000.
Kincaid, John F.; and Reed, Russell, Jr., 4,350,542, Cl. 149-11.000.
Knutson, Richard K.; Webster, Bruce L.; Johnston, John W.; and Rispin, Peter P., 4,350,110, Cl. 114-243.000.
Loker, Aleck; and Archibald, Richard, 4,350,041, Cl. 73-432.00R.
Rosenbaum, Erik, 4,350,959, Cl. 330-110.000.
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Knight, Clifford, 4,350,332, Cl. 271-188.000.
Yabuuchi, Takahiro: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,350,700, Cl. 424-263.000.

Yagasaki, Toshiaki; Masuda, Shunichi; Shimizu, Katsuichi; and Sakamaki, Hisashi, to Canon Kabushiki Kaisha. Feed control device. 4,350,436, Cl. 355-14.0SH.

Yakubovsky, Petr S.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Tsipenjuk, Yakov I.; Goldshtein, Boris G.; Lavnikov, Nikolai S.; Teres, Leonid N.; Urazhdin, Ivan I.; Yakubovsky, Petr S.; Boiko, Vitaly T.; Kalmykov, Anatoly M.; Minyashkin, Dmitry P.; and Stepanov, Mikhail M., 4,350,213, Cl. 173-93.600.

Yamada, Masahide, to Mitsuba Electric Mfg. Co., Ltd. Brush lead structure for motor-immersed fuel pumps. 4,350,909, Cl. 310-62.000.

Yamada, Mitsuhiko, to Dainippon Screen Seizo Kabushiki Kaisha. Lay-out recording method in a picture scanning recording system. 4,350,997, Cl. 358-78.000.

Yamada, Takahiro, to Hitachi, Ltd. Ink jet printer. 4,350,986, Cl. 346-75.000.

Yamada, Yu: *See*—
Seto, Susumu; Tokuhara, Mitsuhiro; Takemura, Yukio; Yamada, Yu; and Kuwayama, Takeshi, 4,350,433, Cl. 355-8.000.

Yamaguchi, Akihiro: *See*—
Nagai, Shosuke; Kato, Toshio; Iguchi, Chojiro H.; Kawashima, Nobuyuki; Mita, Ryuichi; Yamaguchi, Akihiro; and Takano, Takao, 4,350,643, Cl. 260-465.700.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Ishima, Takaharu, 4,350,221, Cl. 180-190.000.
Kitano, Akihiro; and Kamekawa, Kunio, 4,350,124, Cl. 123-198.00R.
Yukishima, Susumu, 4,350,010, Cl. 60-310.000.

Yamamoto, Itaru, to Yamasu Shoyu Kabushiki Kaisha. Method of and reagents for quantitative analysis of cyclic nucleotides. 4,350,761, Cl. 435-7.000.

Yamane, Tadayuki: *See*—
Kawai, Syuji; Yamane, Tadayuki; Abe, Michio; Ono, Toshihiko; and Yamauchi, Shuji, 4,350,594, Cl. 210-637.000.

Yamashita, Nobuo; and Maeda, Miwako, to Olympus Optical Co., Ltd. Endoscope and illumination optical system therefor. 4,350,149, Cl. 128-6.000.

Yamashita, Toshio; Gamo, Takaharu; Moriwaki, Yoshio; and Fukuda, Masataro, to Matsushita Electric Industrial Company, Limited. Method of storing hydrogen. 4,350,673, Cl. 423-644.000.

Yamasu Shoyu Kabushiki Kaisha: *See*—
Yamamoto, Itaru, 4,350,761, Cl. 435-7.000.

Yamauchi, Shuji: *See*—
Kawai, Syuji; Yamane, Tadayuki; Abe, Michio; Ono, Toshihiko; and Yamauchi, Shuji, 4,350,594, Cl. 210-637.000.

Yan, Tsoung-Yuan, to Mobil Oil Company. In situ leaching process. 4,350,391, Cl. 299-4.000.

Yanagisawa, Syozo, to Hitachi, Ltd. Exhaust gas recirculation valve. 4,350,136, Cl. 123-568.000.

Yanagisawa, Yasuo; and Mitsui, Yoshiaki, to Hoya Lens Corporation. Calculating rule useful for making eyeglasses. 4,350,877, Cl. 235-70.00A.

Yang, Elmer C., to Pacific Scientific Company. Mechanical shock arrestor. 4,350,232, Cl. 188-378.000.

Yannas, Ioannis V.; and Forbes, Martin J., to Massachusetts Institute of Technology. Procedures for preparing composite materials from collagen and glycosaminoglycan. 4,350,629, Cl. 260-123.700.

Yano, Kensaku: *See*—
Nakano, Hirotaka; and Yano, Kensaku, 4,350,729, Cl. 428-209.000.

Yao, Shi-Kay: *See*—
August, Rudolf R.; Anderson, Dean B.; and Yao, Shi-Kay, 4,350,916, Cl. 310-313.00B.

Yapoudjian, Claude; and Pochet, Roger, to Societe Anonyme dite: MARS-ACTEL. Connector for insulated electric conductors. 4,350,405, Cl. 339-97.00P.

Yarborough, Lyman: *See*—
Sharp, Shelby P.; and Yarborough, Lyman, 4,350,600, Cl. 252-8.55E.

Yargus, Larry D.: *See*—
Yargus, Lloyd A.; Switzer, Lester W., Sr.; Allen, Gary N.; Elliott, Gary S.; Yargus, Larry D.; Lowry, William D.; Gosnell, Jeffrey M.; and Spires, Darrell J., 4,350,444, Cl. 366-141.000.
Yargus, Lloyd A.; Switzer, Lester W., Sr.; Allen, Gary N.; Elliott, Gary S.; Yargus, Larry D.; Lowry, William D.; Gosnell, Jeffrey M.; and Spires, Darrell J., to Yargus, Lloyd A.; and Yargus, Larry D. Apparatus for mixing materials such as fertilizer components. 4,350,444, Cl. 366-141.000.

Yasuda, Akira, to Nissan Motor Co., Ltd. Device for opening a back door of an automotive vehicle. 4,350,384, Cl. 296-146.000.

Yasuda, Shigeo: *See*—
Matsuda, Akira; Havakawa, Yoshihiro; Yasuda, Shigeo; Iwasaki, Motoaki; and Nishino, Hiroshi, 4,350,854, Cl. 200-61.250.

Yasuda, Shigeru: *See*—
Hasegawa, Yo; Yasuda, Shigeru; and Kojima, Kunio, 4,350,741, Cl. 428-473.500.

Yasunaga, Teibun: *See*—
Murahara, Koichi; and Yasunaga, Teibun, 4,350,458, Cl. 401-145.000.

Yatabe, Thomas T.: *See*—
Parsen, Frank E.; and Yatabe, Thomas T., 4,350,745, Cl. 429-57.000.

Yazaki, Mitsuyoshi: *See*—
Nakamura, Masayoshi; Magari, Teruo; Abe, Seiji; and Yazaki, Mitsuyoshi, 4,350,619, Cl. 252-537.000.

Yeater, Robert P.: *See*—
Schmelzer, Hans G.; Schmidt, Manfred; and Yeater, Robert P., 4,350,799, Cl. 525-453.000.

Yoneda, Kenji: *See*—
Sakata, Kazuhiro; Yuminaka, Takeo; Nakazato, Masao; Yoneda, Kenji; Kuzunuki, Soshiro; and Katayama, Yasunori, 4,350,225, Cl. 187-29.00R.

Yorkshire Electricity Board: *See*—
Richardson, Roy; and Czenkusz, Bernard, 4,350,044, Cl. 73-600.000.

Yoshiba, Yasutaka, to Nissan Motor Company, Limited. Exhaust gas recirculation system. 4,350,013, Cl. 60-605.000.

Yoshida, Akihiro, to Sony Corporation. Method of providing display on molded base. 4,350,654, Cl. 264-129.000.

Yoshida Kogyo Kabushiki Kaisha: *See*—
Fukuroi, Takeo, 4,349,953, Cl. 29-410.000.

Yoshida, Masahiko, to Sanyo Electric Co., Ltd. Apparatus and method for controlling electronic controlled cooking apparatus. 4,350,858, Cl. 219-10.55B.

Yoshida, Masao: *See*—
Takei, Yukio; Yoshida, Masao; and Nishizawa, Rinzo, 4,350,813, Cl. 544-237.000.

Yoshikawa, Akira: *See*—
Mizushima, Yoshihiko; Takeda, Akitsu; Yoshikawa, Akira; Ochi, Osamu; and Hisaki, Tomoko, 4,350,541, Cl. 148-188.000.

Yoshimura, Tooru: *See*—
Nakajima, Yasuo; Hayashi, Yoshimasa; Nagumo, Shin-ichi; and Yoshimura, Tooru, 4,350,129, Cl. 123-440.000.

Yoshinaga, Toru; Igashira, Toshihiko; Mori, Kouichi; Kawai, Hisasi; and Morino, Seiji, to Nippon Soken, Inc. Ignition system for internal combustion engines. 4,350,137, Cl. 123-617.000.

Yoshiya, Kiyosumi, to Radio Research Laboratories, Ministry of Posts and Telecommunications. Method and apparatus for suppressing digital error noise in digital communication. 4,351,062, Cl. 375-99.000.

Young, John M.; and Scovell, Peter D., to ITT Industries Inc. Semiconductor annealing by pulsed heating. 4,350,537, Cl. 148-1.500.

Youngquist, Robert J., to Minnesota Mining and Manufacturing Company. Editor for combining digitally recorded audio signals. 4,351,007, Cl. 360-13.000.

Yuda, Takuo: *See*—
Tanaka, Toshie; and Yuda, Takuo, 4,349,993, Cl. 52-208.000.

Yukawa, Yasumasa: *See*—
Hamada, Isao; Nakayama, Hiroshi; Kawakami, Nobuyoshi; Azami, Hirotaka; Ikeda, Tadasu; Yukawa, Yasumasa; Mitani, Hiroshi; Ohmori, Takashi; Kimura, Masanobu; and Seno, Kohichi, 4,350,510, Cl. 55-349.000.

Yukishima, Susumu, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Exhaust system for an outboard engine. 4,350,010, Cl. 60-310.000.

Yuminaka, Takeo: *See*—
Sakata, Kazuhiro; Yuminaka, Takeo; Nakazato, Masao; Yoneda, Kenji; Kuzunuki, Soshiro; and Katayama, Yasunori, 4,350,225, Cl. 187-29.00R.

Zansky, Zoltan: *See*—
Agarwala, Poonam; and Zansky, Zoltan, 4,350,933, Cl. 315-278.000.

Zasio, John J.; and Samuels, Michael W., to Fujitsu Limited. Discharge device and method for use in processing semiconductor devices. 4,350,866, Cl. 219-121.0EM.

Zattler, Kurt: *See*—
Engelsmann, Dieter; Maas, Dieter; Zattler, Kurt; and Schultes, Herbert, 4,350,420, Cl. 354-145.000.

Zavodov, Rudolf V.: *See*—
Alexandrov, Vyacheslav S.; Guschin, Alexandr E.; Zavodov, Rudolf V.; Zhukova, Elena I.; Ivanov, Alexandr A.; Fofanova, Tatyana S.; Mikhailov, Evgeny I.; Dianov, Ivan M.; Luzin, Pavel M.; Sergeev, Igor A.; Pankratova, Lidia A.; Krylova, Vera E.; and Leibenzon, Semen A., 4,350,482, Cl. 425-83.100.

Zeeh, Bernd: *See*—
Rentzea, Costin; Zeeh, Bernd; Pommer, Ernst-Heinrich; and Mappes, Celia J., 4,350,701, Cl. 424-269.000.
Sauter, Hubert; Zeeh, Bernd; Buschmann, Ernst; and Jung, Johann, 4,350,518, Cl. 71-88.000.

Zenbayashi, Katsuaki; Morinaga, Akio; Hirayama, Masao; and Morita, Akira, to Tokyo Gas Co., Ltd.; and Ashimori Industry, Co., Ltd. Method and apparatus for providing the inner surface of a pipe line with a lining. 4,350,548, Cl. 156-156.000.

Zenner, Dennis W.; and Jenkins, Jesse F., to Stinson Manufacturing Company. Shipping and display cart. 4,350,357, Cl. 280-79.300.

Zexer, Mikhail G.: *See*—
Maisotsenko, Valery S.; Tsimerman, Alexandr B.; and Zexer, Mikhail G., 4,350,570, Cl. 203-10.000.

Zhukova, Elena I.: *See*—
Alexandrov, Vyacheslav S.; Guschin, Alexandr E.; Zavodov, Rudolf V.; Zhukova, Elena I.; Ivanov, Alexandr A.; Fofanova, Tatyana S.; Mikhailov, Evgeny I.; Dianov, Ivan M.; Luzin, Pavel M.; Sergeev, Igor A.; Pankratova, Lidia A.; Krylova, Vera E.; and Leibenzon, Semen A., 4,350,482, Cl. 425-83.100.

Zickwolf, Herbert C., Jr., to United Technologies Corporation. Method of starting turbine engines. 4,350,008, Cl. 60-39.14R.

Ziegler, Carl B., Jr.: *See*—
Porter, Ned A.; Ziegler, Carl B., Jr.; and Roberts, David H., 4,350,834, Cl. 568-568.000.

Zieschang, Jurgen: *See*—
Bick, Klaus; Harmsen, Lothar; Zieschang, Jurgen; and Vennmann, Friedhelm, 4,351,055, Cl. 373-76.000.

Zimmer, William F., to Norton Company. Dampening agent for resin bonded grinding wheels. 4,350,498, Cl. 51-298.000.

Zimmerman, Robert L.: *See*—
Dominguez, Richard J. G.; Rice, Doris M.; and Zimmerman, Robert L., 4,350,778, Cl. 521-118.000.

Zimmermann, Ulrich; Saleemuddin, Mohammed; and Pilwat, Gunter, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method for isolating and purifying enzymes from a crude enzyme solution. 4,350,767, Cl. 435-183.000.

Zingerman, Bryant N.: *See*—
Frieser, Rudolf G.; Ma, William H.; Ozols, Gunars M.; and Zingerman, Bryant N., 4,350,578, Cl. 204-192.00R.

Zlatkevich, Lev: *See*—
Broutman, Lawrence J.; Rozhansky, Boris; and Zlatkevich, Lev, 4,350,495, Cl. 23-230.0PC.

Zoppi, Francesco: *See*—
De Luca, Ugo; and Zoppi, Francesco, 4,350,762, Cl. 435-10.000.

Zschernack, Plano: *See*—
Jochum, Friedrich; Landsberg, Ernst; and Zschernack, Plano, 4,350,224, Cl. 182-82.000.

Zur, Henry C., to Goodman Manufacturing Corporation. Adjustable body supporting assemblies with forward inclining head support. 4,349,924, Cl. 5-68.000.

Zurn Industries, Inc.: *See*—
Gruber, Martin V.; and Doshi, Mahendra F., 4,350,302, Cl. 239-500.000.

Zylkowski, John T.: *See*—
Allen, Ralph A.; and Zylkowski, John T., 4,350,401, Cl. 339-65.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF SEPTEMBER, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Biber, Conrad H.; Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Range synchronized flash photographic apparatus and method for achieving optimum flash exposure. Re. 31,034, Cl. 354-27.000.

Chiyoda Chemical Engineering and Construction Co., Ltd.: *See*—
Inooka, Masayoshi; Wakabayashi, Motoyoshi; Matsuda, Masatoshi; Kasuya, Masaaki; Nakamura, Munekazu; and Morimoto, Tatsuo, Re. 31,036, Cl. 252-456.000.
Inooka, Masayoshi; Wakabayashi, Motoyoshi; and Matsuda, Masatoshi, Re. 31,037, Cl. 252-457.000.
Inooka, Masayoshi; and Wakabayashi, Motoyoshi, Re. 31,038, Cl. 252-457.000.
Inooka, Masayoshi; Ohguchi, Yoshihiro; Matsuda, Masatoshi; Kasuya, Masaaki; Nakamura, Munekazu; and Morimoto, Tatsuo, Re. 31,039, Cl. 252-457.000.

French, Roger F., to Suntime, Inc. Solar water heater. Re. 31,032, Cl. 126-433.000.

Hancock Laboratories, Inc.: *See*—
Hancock, Warren D.; and Sattler, Frederick P., Re. 31,035, Cl. 8-94.110.

Hancock, Warren D.; and Sattler, Frederick P., to Hancock Laboratories, Inc. Arrangement for preparing natural tissue for implantation. Re. 31,035, Cl. 8-94.110.

Inooka, Masayoshi; Wakabayashi, Motoyoshi; Matsuda, Masatoshi; Kasuya, Masaaki; Nakamura, Munekazu; and Morimoto, Tatsuo, to Chiyoda Chemical Engineering and Construction Co., Ltd. Catalysts for demetallization treatment of hydrocarbons supported on sepiolite. Re. 31,036, Cl. 252-456.000.

Inooka, Masayoshi; Wakabayashi, Motoyoshi; and Matsuda, Masatoshi, to Chiyoda Chemical Engineering & Construction Co., Ltd. Catalysts for demetallization treatment of hydrocarbons supported on sepiolite. Re. 31,037, Cl. 252-457.000.

Inooka, Masayoshi; and Wakabayashi, Motoyoshi, to Chiyoda Chemical Engineering & Construction Co., Ltd. Catalysts for demetallization treatment of hydrocarbons supported on sepiolite. Re. 31,038, Cl. 252-457.000.

Inooka, Masayoshi; Ohguchi, Yoshihiro; Matsuda, Masatoshi; Kasuya, Masaaki; Nakamura, Munekazu; and Morimoto, Tatsuo, to Chiyoda Chemical Engineering & Construction Co., Ltd. Catalysts for demetallization treatment of hydrocarbons supported on sepiolite. Re. 31,039, Cl. 252-457.000.

Johnson, Bruce K.: *See*—
Biber, Conrad H.; Johnson, Bruce K.; and Whiteside, George D., Re. 31,034, Cl. 354-27.000.

Kasuya, Masaaki: *See*—
Inooka, Masayoshi; Wakabayashi, Motoyoshi; Matsuda, Masatoshi; Kasuya, Masaaki; Nakamura, Munekazu; and Morimoto, Tatsuo, Re. 31,036, Cl. 252-456.000.
Inooka, Masayoshi; Ohguchi, Yoshihiro; Matsuda, Masatoshi; Kasuya, Masaaki; Nakamura, Munekazu; and Morimoto, Tatsuo, Re. 31,039, Cl. 252-457.000.

Machcinski, Stephen A.: *See*—
Wilson, Lester E., Jr.; and Machcinski, Stephen A., Re. 31,033, Cl. 339-192.00R.

Matsuda, Masatoshi: *See*—
Inooka, Masayoshi; Wakabayashi, Motoyoshi; Matsuda, Masatoshi; Kasuya, Masaaki; Nakamura, Munekazu; and Morimoto, Tatsuo, Re. 31,036, Cl. 252-456.000.
Inooka, Masayoshi; Wakabayashi, Motoyoshi; and Matsuda, Masatoshi, Re. 31,037, Cl. 252-457.000.
Inooka, Masayoshi; Ohguchi, Yoshihiro; Matsuda, Masatoshi; Kasuya, Masaaki; Nakamura, Munekazu; and Morimoto, Tatsuo, Re. 31,039, Cl. 252-457.000.

Morimoto, Tatsuo: *See*—
Inooka, Masayoshi; Wakabayashi, Motoyoshi; Matsuda, Masatoshi; Kasuya, Masaaki; Nakamura, Munekazu; and Morimoto, Tatsuo, Re. 31,036, Cl. 252-456.000.
Inooka, Masayoshi; Ohguchi, Yoshihiro; Matsuda, Masatoshi; Kasuya, Masaaki; Nakamura, Munekazu; and Morimoto, Tatsuo, Re. 31,039, Cl. 252-457.000.

Nakamura, Munekazu: *See*—
Inooka, Masayoshi; Wakabayashi, Motoyoshi; Matsuda, Masatoshi; Kasuya, Masaaki; Nakamura, Munekazu; and Morimoto, Tatsuo, Re. 31,036, Cl. 252-456.000.
Inooka, Masayoshi; Ohguchi, Yoshihiro; Matsuda, Masatoshi; Kasuya, Masaaki; Nakamura, Munekazu; and Morimoto, Tatsuo, Re. 31,039, Cl. 252-457.000.

Ohguchi, Yoshihiro: *See*—
Inooka, Masayoshi; Ohguchi, Yoshihiro; Matsuda, Masatoshi; Kasuya, Masaaki; Nakamura, Munekazu; and Morimoto, Tatsuo, Re. 31,039, Cl. 252-457.000.

Polaroid Corporation: *See*—
Biber, Conrad H.; Johnson, Bruce K.; and Whiteside, George D., Re. 31,034, Cl. 354-27.000.

Sattler, Frederick P.: *See*—
Hancock, Warren D.; and Sattler, Frederick P., Re. 31,035, Cl. 8-94.110.

Suntime, Inc.: *See*—
French, Roger F., Re. 31,032, Cl. 126-433.000.

Wakabayashi, Motoyoshi: *See*—
Inooka, Masayoshi; Wakabayashi, Motoyoshi; Matsuda, Masatoshi; Kasuya, Masaaki; Nakamura, Munekazu; and Morimoto, Tatsuo, Re. 31,036, Cl. 252-456.000.
Inooka, Masayoshi; Wakabayashi, Motoyoshi; and Matsuda, Masatoshi, Re. 31,037, Cl. 252-457.000.
Inooka, Masayoshi; and Wakabayashi, Motoyoshi, Re. 31,038, Cl. 252-457.000.

Whiteside, George D.: *See*—
Biber, Conrad H.; Johnson, Bruce K.; and Whiteside, George D., Re. 31,034, Cl. 354-27.000.

Wilson, Lester E., Jr.; and Machcinski, Stephen A. Electrical power distribution assembly. Re. 31,033, Cl. 339-192.00R.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Brown, Peter William, to Girling Limited. Disc brakes and mounting structure therefor. B1 Re. 29,582, Cl. 188—73.

Girling Limited: *See*—
Brown, Peter William. B1 Re. 29,582, Cl. 188—73.

Parks, Earl R. Row crop planter. B1 4,148,414, Cl. 221—278.

Swarbrick, Peter; Green, William John; and Maillefer, Charles, to BICC Limited and Etablissements Maillefer SA. Manufacture of extruded products. B1 4,117,195, Cl. 428—379.

BICC Limited and Etablissements Maillefer SA: *See*—
Swarbrick, Peter; Green, William John; and Maillefer, Charles. B1 4,117,195, Cl. 428—379.

LIST OF DESIGN PATENTEES

A. T. Cross Company: *See—*
Lockwood, Arnold G.; Tucker, William E.; and Harris, Robert L., 266,258, Cl. D19-49.000.
Tucker, William E.; and Graham, George W., 266,259, Cl. D19-54.000.

AB Jarnarmatur: *See—*
Pettersson, Dan A. B., 266,282, Cl. D32-66.000.

Adamcik, Michael. Combined water closet cover and bathroom cabinet. 266,268, 9-21-82, Cl. D23-69.000.

AGFA-Gevaert AG: *See—*
Schultes, Herbert; and Rubner, Karl-Heinz, 266,251, Cl. D16-1.000.

Ahrens, Robert H., to Schwaab, Inc. Hand operated ink stamp. 266,257, 9-21-82, Cl. D18-15.000.

Horikoshi, Shuzo; Sugiyama, Yoshihiko; Kawamura, Ken; Kawakami, Yoshihiko; Kuriyagawa, Teruo; Matsumura, Makoto; Kobayashi, Shoichi; and Akai, Keiko, 266,254, Cl. D16-31.000.

Akai, Keiko: *See—*
Horikoshi, Shuzo; Sugiyama, Yoshihiko; Kawamura, Ken; Kawakami, Yoshihiko; Kuriyagawa, Teruo; Matsumura, Makoto; Kobayashi, Shoichi; and Akai, Keiko, 266,253, Cl. D16-31.000.

Allcraft Plastic Company, Inc.: *See—*
Heil, John, 266,213, Cl. D6-97.000.

Aoki, Masahide; Obata, Takeichi; and Fujii, Takashi, to Hitachi, Ltd. Television receiver. 266,248, 9-21-82, Cl. D14-80.000.

Appleman, Donald T., to Procter & Gamble Company, The. Continuous sheet material or the like. 266,283, 9-21-82, Cl. D59-2.00B.

Aqualine Products Limited: *See—*
Littlefield, Reg, 266,214, Cl. D6-97.000.

Arns, Gale A. Sawbuck. 266,274, 9-21-82, Cl. D25-67.000.

Audivox, Inc.: *See—*
Johanson, Donald L.; and Chan, Thomas S., 266,271, Cl. D24-35.000.

Bass, Wayne E. Infant bottle holding device. 266,273, 9-21-82, Cl. D24-48.000.

Berman, Charles. Belt mounted accessory bag or the like. 266,200, 9-21-82, Cl. D2-400.000.

Berman, Charles. Belt mounted make-up case or the like. 266,201, 9-21-82, Cl. D2-400.000.

Berman, Charles. Belt mounted bag or the like. 266,202, 9-21-82, Cl. D2-400.000.

Berman, Charles. Belt mounted accessory bag or the like. 266,203, 9-21-82, Cl. D2-400.000.

Berman, Charles. Belt mounted cigarette case or the like. 266,204, 9-21-82, Cl. D2-400.000.

Berman, Charles. Belt mounted eyeglass case or the like. 266,205, 9-21-82, Cl. D3-34.000.

Bowden, William A., to Dacor Corporation. Swim fin. 266,265, 9-21-82, Cl. D21-239.000.

Bratton, Harry S. Suspendible wine rack. 266,215, 9-21-82, Cl. D6-113.000.

Brittner, Frank W. Display case. 266,219, 9-21-82, Cl. D6-172.000.

Bronander, Wilhelm B., Jr. Multi-pack cigarette package. 266,224, 9-21-82, Cl. D9-337.000.

Brookes, Malcolm J.: *See—*
Burbo, James H.; Hartman, Louis P.; Spranger, Douglas M.; Brookes, Malcolm J.; and Mulhauser, Paul J., 266,255, Cl. D16-133.000.

Burbo, James H.; Hartman, Louis P.; Spranger, Douglas M.; Brookes, Malcolm J.; and Mulhauser, Paul J., to International Telephone and Telegraph Corporation. Aviator night vision imaging apparatus or similar article. 266,255, 9-21-82, Cl. D16-133.000.

Buscher, John H., to Eastman Machine Company. Rotary shear for use in cutting cloth and the like. 266,222, 9-21-82, Cl. D8-61.000.

Cannon, Gary L.; and Wilkins, Ronald B. Video game tote case. 266,208, 9-21-82, Cl. D3-74.000.

Capitol Products Corporation: *See—*
Schmidt, Dietrich F., 266,275, Cl. D25-74.000.

Casio Computer Co. Ltd.: *See—*
Tsukahard, Kaoru, 266,230, Cl. D10-38.000.

Champion International Corporation: *See—*
Zdarsky, Robert C.; and Lyons, Russell J., 266,226, Cl. D9-418.000.

Chan, Thomas S.: *See—*
Johanson, Donald L.; and Chan, Thomas S., 266,271, Cl. D24-35.000.

Chasen, Lee R.: *See—*
Einhorn, Ruediger; and Chasen, Lee R., 266,260, Cl. D19-91.000.
Einhorn, Ruediger; and Chasen, Lee R., 266,261, Cl. D19-91.000.

Christensen, Harvey E.; Moretz, Charles H.; and Moretz, John M. Thermal ice pouch. 266,272, 9-21-82, Cl. D24-43.000.

Clay, Donald L.: *See—*
Ellis, William H.; and Clay, Donald L., 266,281, Cl. D32-56.000.

Coats & Clark, Inc.: *See—*
Einhorn, Ruediger; and Chasen, Lee R., 266,260, Cl. D19-91.000.
Einhorn, Ruediger; and Chasen, Lee R., 266,261, Cl. D19-91.000.

Colwell, Walter R. Body of an armored land vehicle. 266,234, 9-21-82, Cl. D12-12.000.

Combi Co., Ltd.: *See—*
Nakao, Shinroku; and Kobayashi, Kouichi, 266,236, Cl. D12-129.000.

Dacor Corporation: *See—*
Bowden, William A., 266,265, Cl. D21-239.000.

Daddona, Anthony L., Jr. Hair styling implement or similar article. 266,278, 9-21-82, Cl. D28-21.000.

Darken, James Hoarce: *See—*
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365 4,350,095

CLASS 102

209 4,350,096
275.2 4,350,097

CLASS 106

19 4,350,531
30 4,350,532
89 4,350,533
288 Q 4,350,534
308 Q 4,350,535

CLASS 108

6 4,350,098
56.1 4,350,099

CLASS 110

203 4,350,100
238 4,350,101
246 4,350,102
264 4,350,103

CLASS 112

220 4,350,104
256 4,350,105
410 4,350,106

CLASS 114

67 A 4,350,107
102 4,350,108
105 4,350,109
243 4,350,110
245 4,350,111
260 4,350,112
270 4,350,113
339 4,350,114

CLASS 116

70 4,350,115

CLASS 118

500 4,350,116

CLASS 119

27 4,350,117
51 R 4,350,118
4,350,119
51.13 4,350,120
103 4,350,121
106 4,350,122

CLASS 123

2 4,350,123
198 R 4,350,124
261 4,350,125
315 4,350,126
364 4,350,127
369 4,350,128
440 4,350,129
4,350,130
453 4,350,131
490 4,350,132
550 4,350,133
557 4,350,134
564 4,350,135
568 4,350,136
617 4,350,137

CLASS 124

24 R 4,350,138

CLASS 126

77 4,350,139
276 4,350,140
287 4,350,141
288 4,350,142
415 4,350,143
427 4,350,144
433 Re.31,032
434 4,350,145
447 4,350,146

CLASS 128

4 4,350,147
4,350,148
6 4,350,149
4,350,150
17 4,350,151
24 R 4,350,152
84 C 4,350,153
136 4,350,154
213 R 4,350,155
214 R 4,350,156
4,350,157
224 4,350,158
303 B 4,350,159
334 R 4,350,160
349 BV 4,350,161
477 4,350,162
633 4,350,163
639 4,350,164
640 4,350,165
664 4,350,166
727 4,350,167
736 4,350,168
783 4,350,169

CLASS 131

84 R 4,350,170
234 4,350,171
322 4,350,172
332 4,350,173

CLASS 134

104 4,350,174

CLASS 135

33 C 4,350,175

CLASS 136

244 4,350,836
246 4,350,837

CLASS 137

242 4,350,176
370 4,350,177
444 4,350,178
540 4,350,179
596.17 4,350,180
614 4,350,181
625.27 4,350,182

CLASS 138

89 4,350,183

CLASS 139

448 4,350,184

CLASS 141

35 4,350,185
83 4,350,186
90 4,350,187

CLASS 144

2 Z 4,350,188
4,350,189
3 D 4,350,190
172 4,350,191
193 C 4,350,192
286 R 4,350,193

CLASS 148

1.5 4,350,536
4,350,537
12.D 4,350,538
31.5 4,350,539
4,350,540
188 4,350,541

CLASS 149

11 4,350,542

CLASS 150

1.5 C 4,350,194
39 4,350,195

CLASS 152

5 4,350,196

CLASS 156

62.8 4,350,543
79 4,350,544
87 4,350,545
93 4,350,546
143 4,350,547
156 4,350,548
161 4,350,549
237 4,350,550
245 4,350,551
254 4,350,552
345 4,350,553
384 4,350,554
540 4,350,555
541 4,350,556
601 4,350,557
617 SP 4,350,558
4,350,559
4,350,560
624 4,350,561
639 4,350,562
643 4,350,563
659.1 4,350,564

CLASS 159

47 R 4,350,565

CLASS 160

166 A 4,350,197
179 4,350,198
201 4,350,199

CLASS 162

72 4,350,566
145 4,350,567

CLASS 165

48 S 4,350,200
76 4,350,201
95 4,350,202

CLASS 166

51 4,350,203
175 4,350,204
375 4,350,205

CLASS 169

47 4,350,206

CLASS 171

58 4,350,207

CLASS 172

1 4,350,208
7 4,350,209
143 4,350,210
311 4,350,211

CLASS 173

6 4,350,212
93.6 4,350,213
126 4,350,214

CLASS 174

15 R 4,350,838
65 G 4,350,839
65 SS 4,350,840
87 4,350,841
92 4,350,842
94 R 4,350,843

CLASS 175

329 4,350,215

CLASS 177

164 4,350,216
246 4,350,217
255 4,350,218

CLASS 178

22.18 4,350,844

CLASS 179

1 C 4,350,846

1 GA 4,350,847
1 J 4,350,845
2 DP 4,350,848
175 4,350,849

CLASS 180

65 R 4,350,219
165 4,350,220
190 4,350,221
209 4,350,222

CLASS 181

229 4,350,223

CLASS 182

82 4,350,224

CLASS 187

29 R 4,350,225
4,350,226

CLASS 188

2 F 4,350,227
71.9 4,350,228
73 B1 Re. 29,582
73.45 4,350,229
79 4,350,230
218 XL 4,350,231
378 4,350,232
4,350,233

CLASS 191

12.2 R 4,350,850
39 4,350,851

CLASS 192

4 A 4,350,234
45 4,350,235
84 C 4,350,236
116.5 4,350,237

CLASS 194

1 G 4,350,239
1 N 4,350,238
92 4,350,240

CLASS 198

311 4,350,241
605 4,350,242
769 4,350,243
773 4,350,244

CLASS 200

42 A 4,350,852
52 R 4,350,853
61.25 4,350,854
292 4,350,855
306 4,350,856
314 4,350,857

CLASS 202

180 4,350,568

CLASS 203

2 4,350,569
10 4,350,570
21 4,350,571
35 4,350,572
86 4,350,573

CLASS 204

56 R 4,350,574
84 4,350,575
101 4,350,576
157.1 R 4,350,577
192 R 4,350,578
195 R 4,350,579
279 4,350,580
301 4,350,581

CLASS 206

207 4,350,245
210 4,350,246
387 4,350,247
455 4,350,248
566 4,350,249
605 4,350,250

CLASS 208

8 LE 4,350,582
310 Z 4,350,583

CLASS 209

352 4,350,584
642 4,350,251

CLASS 210

94 4,350,585
149 4,350,586
151 4,350,587
208 4,350,588
220 4,350,589
243 4,350,590
384 4,350,591
450 4,350,592
516 4,350,593
637 4,350,594
656 4,350,595
708 4,350,596
710 4,350,597
751 4,350,598
761 4,350,599

CLASS 211

40 4,350,252
74 4,350,253

CLASS 212

153 4,350,254
268 4,350,255

CLASS 213

69 4,350,256

CLASS 219

10.55 B 4,350,858
4,350,860
10.55 F 4,350,859
10.61 R 4,350,861
64 4,350,862
69 M 4,350,865
69 P 4,350,863
69 W 4,350,864
121 EM 4,350,866
121 LC 4,350,867
137 R 4,350,868
4,350,869
216 4,350,870
343 4,350,871
376 4,350,872
388 4,350,873
400 4,350,874
449 4,350,875
497 4,350,876

CLASS 220

4 F 4,350,257
22 4,350,258
66 4,350,259
254 4,350,260
270 4,350,261
273 4,350,262
359 4,350,263

CLASS 221

67 4,350,264
278 B1 4,148,414

CLASS 222

38 4,350,265
40 4,350,266
131 4,350,267
214 4,350,268
227 4,350,269
336 4,350,270
386.5 4,350,271
4,350,272
400.8 4,350,273

CLASS 224

205 4,350,274

CLASS 226

14 4,350,275
16 4,350,276
190 4,350,277
4,350,278

CLASS 227

156 4,350,279

CLASS 228

29 4,350,280

CLASS 229

38 4,350,281

CLASS 233

7 4,350,282
26 4,350,283
27 4,350,284

CLASS 235

70 A 4,350,877
78 RC 4,350,878
92 EC 4,350,879
96 4,350,880
400 4,350,881
4,350,882
435 4,350,883

CLASS 236

1 R 4,350,285
44 A 4,350,286

CLASS 237

12.3 A 4,350,287
4,350,289
12.3 C 4,350,288

CLASS 238

17 4,350,290
349 4,350,291

CLASS 239

7 4,350,292
155 4,350,293
169 4,350,294
178 4,350,295
201 4,350,296
265.35 4,350,297
333 4,350,298
337 4,350,299
396 4,350,300
453 4,350,301
500 4,350,302
673 4,350,303
703 4,350,304

CLASS 241

46 B 4,350,305
46.15 4,350,306
81 4,350,307
294 4,350,308

CLASS 242

68.3 4,350,309
75.2 4,350,310
83 4,350,311
84.2 G 4,350,312
107.4 C 4,350,313

CLASS 244

1 R 4,350,314
3.23 4,350,315
63 4,350,316

CLASS 248

588 4,350,317

CLASS 249

40 4,350,318

CLASS 250

204 4,350,884
231 R 4,350,885
239 4,350,886
265 4,350,887
270 4,350,888
372 4,350,890
461.2 4,350,892
484.1 4,350,893
504 R 4,350,894

CLASS 251

65 4,350,319
129 4,350,320
149.6 4,350,321
229 4,350,322

CLASS 252

8.55 E 4,350,600
8.55 R 4,350,601
75 4,350,602
299.1 4,350,603
301.4 R 4,350,604
305 4,350,605
392 4,350,606
408 4,350,607
425.3 4,350,608
429 R 4,350,610
435 4,350,611
441 4,350,612
455 R 4,350,613
455 Z 4,350,614
4,350,615
456 Re.31,036
457 Re.31,037
Re.31,038
Re.31,039
463 4,350,616
465 4,350,609
477 R 4,350,617
514 4,350,618
537 4,350,619
628 4,350,620

CLASS 254

273 4,350,323

CLASS 260

112 R 4,350,624
4,350,625
112.5 E 4,350,627
112.5 R 4,350,626
4,350,628
123.7 4,350,629
239.3 A 4,350,630
245.2 T 4,350,631
314.5 4,350,632
326.11 R 4,350,633
326.13 B 4,350,634
326.47 4,350,635
465 D 4,350,640
4,350,642
465 E 4,350,641
465.7 4,350,643
501.15 4,350,644
978 4,350,645

CLASS 261

29 4,350,646
65 4,350,647
120 4,350,648

CLASS 264

23 4,350,649
39 4,350,650
65 4,350,651
104 4,350,652
127 4,350,653
129 4,350,654
145 4,350,655
166 4,350,656
349 4,350,657

CLASS 266

44 4,350,324
196 4,350,325
201 4,350,326

CLASS 270

54 4,350,327

CLASS 271

9 4,350,329
12 4,350,330
22 4,350,328
95 4,350,331
188 4,350,332
217 4,350,333
274 4,350,334

CLASS 272

67 4,350,335
69 4,350,336

CLASS 273

43 A 4,350,337
55 B 4,350,338
148 A 4,350,339
153 R 4,350,340
157 R 4,350,341
240 4,350,342
247 4,350,343
333 4,350,344

CLASS 277

3 4,350,345
26 4,350,346
153 4,350,347
199 4,350,348
4,350,349
207 A 4,350,350
4,350,351
216 4,350,352

CLASS 280

5 C 4,350,353
6 H 4,350,354
28.5 4,350,355
47.26 4,350,356
79.3 4,350,357
81 R 4,350,358
203 4,350,359
279 4,350,360
289 A 4,350,361
478 A 4,350,362
481 4,350,363
605 4,350,364
4,350,365
655 4,350,366
756 4,350,367
804 4,350,368
4,350,369
4,350,370

CLASS 285

18 4,350,371
45 4,350,372
55 4,350,373
132 4,350,374

CLASS 290

55 4,350,895
4,350,896
4,350,897
4,350,898
4,350,899
4,350,900

CLASS 292

24 4,350,375
263 4,350,376
288 4,350,377

CLASS 293

120 4,350,378

CLASS 294

65.5 4,350,379
74 4,350,380
88 4,350,381

CLASS 296

38 4,350,382
72 4,350,383
146 4,350,384
222 4,350,385

CLASS 297

85 4,350,386
4,350,387
284 4,350,388
410 4,350,389
452 4,350,390

CLASS 299

4 4,350,391
13 4,350,392
50 4,350,393

CLASS 301

38 R 4,350,394

CLASS 303

6 C 4,350,395
115 4,350,396

CLASS 307

10 R 4,350,901
221 D 4,350,902
252 B 4,350,903
310 4,350,904
451 4,350,905
469 4,350,906

CLASS 308

212 4,350,397
216 4,350,398

CLASS 310

37 4,350,907
61 4,350,908
62 4,350,909
64 4,350,910
87 4,350,911
90 4,350,912
103 4,350,913
194 4,350,914
306 4,350,915
313 B 4,350,916
320 4,350,917
367 4,350,918

CLASS 312

138 R 4,350,399

CLASS 313

99 4,350,919
346 R 4,350,920
360.1 4,350,921
402 4,350,922
414 4,350,923
441 4,350,924
451 4,350,925
455 4,350,926

CLASS 315

5.41 4,350,927
39.3 4,350,928
49 4,350,929
4,350,930
72 4,350,931
169.2 4,350,932
278 4,350,933
282 4,350,934
291 4,350,935

CLASS 318

7 4,350,936
331 4,350,937
443 4,350,938
592 4,350,939
603 4,350,940
4,350,941
626 4,350,942
696 4,350,943
779 4,350,944
795 4,350,945

CLASS 320

22 4,350,946

CLASS 322

17 4,350,947

CLASS 323

282 4,350,948
284 4,350,949

CLASS 324

78 D 4,350,950
133 4,350,951
166 4,350,952
183 4,350,953
208 4,350,954
303 4,350,955

CLASS 328

167 4,350,956

CLASS 329

107 4,350,957

CLASS 330

110 4,350,959
286 4,350,958

CLASS 331

158 4,350,961

CLASS 332

60 4,350,962

CLASS 333

151 4,350,963
213 4,350,964

CLASS 337

47 4,350,965
302 4,350,966
343 4,350,967

CLASS 338

13 4,350,968

CLASS 339

50 C 4,350,400
65 4,350,401
74 R 4,350,402
91 R 4,350,403
97 P 4,350,405
97 R 4,350,404
111 4,350,406
113 L 4,350,407
149 S 4,350,408
186 M 4,350,409
192 R Re.31,033

CLASS 340

23 4,350,969
4,350,970
52 R 4,350,971
347 CC 4,350,975
347 DA 4,350,974
4,350,976
347 DD 4,350,973
545 4,350,977
550 4,350,978
825 4,350,972
861 4,350,979
870.02 4,350,980
870.37 4,350,981

CLASS 343

6.8 R 4,350,982
103 4,350,983
112 R 4,350,984
702 4,350,985

CLASS 346

75 4,350,986
76 PH 4,350,987
108 4,350,988
140 R 4,350,989

CLASS 350

170 4,350,410
174 4,350,411
292 4,350,412
356 4,350,413
357 4,350,414
422 4,350,415
427 4,350,416

CLASS 353

90 4,350,417

CLASS 354

25 4,350,418
27 Re.31,034
110 4,350,419
145 4,350,420
152 4,350,421
173 4,350,422
4,350,423
4,350,424
207 4,350,425
234 4,350,426
238 4,350,427
254 4,350,428
299 4,350,429
330 4,350,430

CLASS 355

1 4,350,431
3 DD 4,350,432
4,350,440
8 4,350,433
14 C 4,350,435
14 SH 4,350,434
4,350,436
4,350,439
52 4,350,437
68 4,350,438

CLASS 356

40 4,350,441
51 4,350,442
358 4,350,443

CLASS 357

16 4,350,990
23 4,350,991
4,350,992
29 4,350,993
67 4,350,994

CLASS 358

37 4,350,995
75 4,350,996

78 4,350,997
111 4,350,998
147 4,350,999
158 4,351,000
4,351,001
4,351,002
166 4,351,003
213 4,351,004
300 4,351,005

CLASS 360

9 4,351,006
13 4,351,007
40 4,351,008
105 4,351,009
131 4,351,010

CLASS 361

82 4,351,011
96 4,351,012
4,351,013
100 4,351,014
119 4,351,015
181 4,351,016

CLASS 362

147 4,351,017
215 4,351,018
298 4,351,019

CLASS 363

26 4,351,020
49 4,351,021
87 4,351,022

CLASS 364

187 4,351,023
200 4,351,024
4,351,025
423 4,351,026
432 4,351,027
483 4,351,028
511 4,351,029
552 4,351,030
580 4,351,031
724 4,351,032
900 4,351,033

CLASS 365

189 4,351,034

CLASS 366

141 4,350,444
343 4,350,445

CLASS 367

14 4,351,035
20 4,351,036
85 4,351,037
105 4,351,038

CLASS 368

76 4,351,039
88 4,351,040
4,351,041
188 4,351,042
252 4,351,043

CLASS 369

43 4,351,044
55 4,351,045
233 4,351,046
270 4,351,047
288 4,351,048

CLASS 370

62 4,351,049

CLASS 371

12 4,351,050

CLASS 372

36 4,351,051
46 4,350,960
58 4,351,052
61 4,351,053

CLASS 373

38 4,351,054
76 4,351,055
88 4,351,056
117 4,351,057
155 4,351,058

CLASS 374

13 4,350,446

CLASS 375

10 4,351,059
12 4,351,060
20 4,351,061
99 4,351,062

CLASS 378

46 4,350,889
79 4,351,063
110 4,350,891

CLASS 400

118 4,350,447
120 4,350,448
4,350,449
124 4,350,450
208 4,350,451
4,350,452
4,350,453
234 4,350,454
279 4,350,455
344 4,350,456

CLASS 401

11 4,350,457
145 4,350,458

CLASS 403

263 4,350,459

CLASS 404

117 4,350,460

CLASS 405

128 4,350,461
259 4,350,462

CLASS 409

234 4,350,463

CLASS 411

180 4,350,464
186 4,350,465

CLASS 414

128 4,350,466
144 4,350,467
325 4,350,468
420 4,350,469
430 4,350,470
463 4,350,471

CLASS 415

125 4,350,472

CLASS 416

1 4,350,473
7 4,350,474

CLASS 417

238 4,350,475
304 4,350,476
384 4,350,477
417 4,350,478

CLASS 418

55 4,350,479
201 4,350,480

CLASS 422

40 4,350,658
61 4,350,659
90 4,350,660
98 4,350,661
122 4,350,662
137 4,350,663
179 4,350,664
191 4,350,665
263 4,350,666

CLASS 423

24 4,350,667
139 4,350,668
235 4,350,669
244 4,350,670
320 4,350,671
445 4,350,672
644 4,350,673

CLASS 424

1 4,350,674
4,350,675
7 4,350,676
12 4,350,677
27 4,350,678
38 4,350,679
45 4,350,685
52 4,350,680
53 4,350,681
64 4,350,682
85 4,350,683
88 4,350,686
92 4,350,684
177 4,350,687
182 4,350,688
232 4,350,689
243 4,350,690
244 4,350,691
246 4,350,692
4,350,693
248.54 4,350,694
251 4,350,695
4,350,696
4,350,697
258 4,350,698
263 4,350,699
4,350,700
269 4,350,701
270 4,350,702
274 4,350,703
4,350,704
278 4,350,705
322 4,350,706
346 4,350,707

CLASS 425

73 4,350,481
83.1 4,350,482
115 4,350,483
140 4,350,484
389 4,350,485
412 4,350,486

CLASS 426

11 4,350,708
19 4,350,710
102 4,350,711
134 4,350,712
243 4,350,713
319 4,350,709
559 4,350,714
570 4,350,715
626 4,350,716

CLASS 427

8 4,350,717
181 4,350,718
253 4,350,719
401 4,350,720

CLASS 428

33 4,350,721
35 4,350,722
42 4,350,723
69 4,350,724
95 4,350,725
4,350,726
102 4,350,727
105 4,350,728
209 4,350,729
215 4,350,730
234 4,350,731
246 4,350,732
290 4,350,733
308.4 4,350,734
328 4,350,735
341 4,350,736
379 B1 4,117,195
383 4,350,737
4,350,738
425.1 4,350,739
461 4,350,740
473.5 4,350,741
520 4,350,742
622 4,350,743
630 4,350,744

CLASS 429

57 4,350,745
121 4,350,746
184 4,350,747

CLASS 430

49 4,350,748
100 4,350,749
125 4,350,750
135 4,350,751
190 4,350,753
219 4,350,752
4,350,754
264 4,350,755
331 4,350,756
422 4,350,757
567 4,350,758
630 4,350,759

CLASS 433

14 4,350,487
32 4,350,488

CLASS 434

40 4,350,489
274 4,350,490

CLASS 435

7 4,350,760
4,350,761
10 4,350,762
29 4,350,763
69 4,350,764
161 4,350,765
4,350,766
183 4,350,767
241 4,350,768
243 4,350,769
253 4,350,770

CLASS 455

29 4,351,064

CLASS 474

12 4,350,491

CLASS 501

97 4,350,771

CLASS 518

714 4,350,772

CLASS 521

31 4,350,773
95 4,350,774
100 4,350,775
110 4,350,776
4,350,777
118 4,350,778
126 4,350,779
137 4,350,780
149 4,350,781

CLASS 523

334 4,350,782
505 4,350,783

CLASS 524

55 4,350,785
263 4,350,786
302 4,350,787
309 4,350,788
391 4,350,623
759 4,350,784
831 4,350,622

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